NEW CURRICULA

Advanced Training in Neurology (Paediatrics & Child Health)

Curriculum standards

RACP Specialists. Together

About this document

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

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

Contents

Program overview

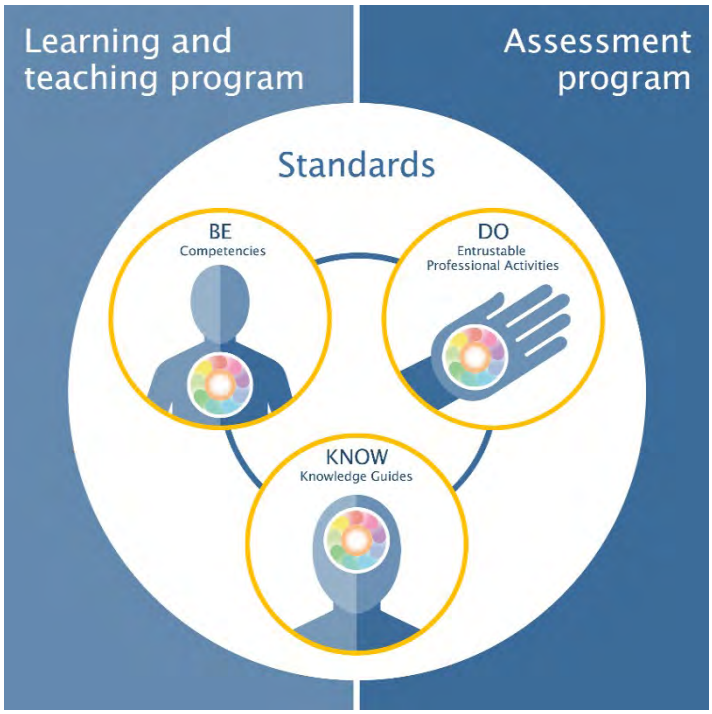
Purpose of Advanced Training

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.

Neurology (Paediatrics & Child Health) specialty overview

The practice of paediatric neurology encompasses the diagnosis and management of diseases affecting the central, peripheral, and autonomic nervous systems, as well as muscle.

Paediatric neurologists demonstrate knowledge of neuroanatomy, neurogenetics, neuroimmunology, neuropathology, neuropharmacology, and neurophysiology, as well as neurological conditions, including those which are common and rare, and those which need to be dealt with as emergencies.

Paediatric neurologists work in public hospitals and private practice. They care for children from the antenatal period to adolescence, overseeing children and their families who have a broad range of neurological conditions. They apply adaptable but in-depth clinical skills appropriate to the developmental stage of the child. As knowledge in the field increases and the landscape is ever-changing, paediatric neurologists must be aware of and adapt with these changes.

Paediatric neurologists are skilled diagnosticians who reach accurate diagnoses by taking detailed histories, performing thorough neurological examinations, and investigating patients rationally by using tools such as imaging, lumbar puncture, neurophysiology, and/or genetics. They are expected to be familiar with neurophysiological investigations.

Paediatric neurologists:

- **apply a multidisciplinary approach.** Paediatric neurologists are required to work effectively as part of a multidisciplinary team. They need to liaise with other medical and allied health professionals.
- **work sensitively with a variety of patients and their families.** Paediatric neurologists work with patients and their families and/or carers to address determinants of health that affect them and their access to needed health services or resources. They provide culturally safe education and support in a professional, empathic, and non-judgemental manner. Some neurological conditions are life-limiting so paediatric neurologists must be able to provide a prognosis and support to these patients and their carers, as well as empathetically manage end-of-life issues.
- **demonstrate strong communication skills.** Paediatric neurologists must develop a personable interviewing technique to support their investigations, and an ability to relate to children and young people and their carers. They appreciate when referral to a more appropriate or more qualified practitioner in a particular subspecialty is necessary.
- **apply an evidence-based approach.** Paediatric neurologists conduct and apply research to make evidence-based decisions that improve the treatment and management of their patients. Furthermore, the rapid expansion in knowledge, particularly in areas of diagnosis and treatment, necessitates the ability to keep up to date with research, and paediatric neurologists must identify appropriate resources to do this.

- **demonstrate cultural competency.** Paediatric neurologists must empathetically consider cultural differences when assessing, managing, and counselling patients and their families and/or carers. At times, this may include consideration or understanding of alternate therapies that may be desired, alongside evidence-based treatments.

Neurology (Paediatrics & Child Health) learning goals

The curriculum standards are summarised as 25 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 in care 7. Acute care 8. Longitudinal care 9. Communication with patients 10. Prescribing 11. Procedures 12. Investigations 13. Clinic management 14. End-of-life care
KNOW Knowledge guides	15. Scientific foundations of paediatric neurology 16. Congenital malformation disorders 17. Developmental delay and regression 18. Pain, including headache, facial pain, and sensory loss 19. Disorders of consciousness and sleep 20. Paroxysmal disorders, including seizures, syncope, and stroke 21. Disorders of vision and other senses 22. Weakness disorders of speech, language, and swallowing 23. Disorders of gait and balance, including disequilibrium, dizziness, and vertigo 24. Movement disorders 25. Neonatal neurology

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, families, whānau, or carers[1], and in collaboration with the healthcare 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.[2]

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.

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

Cultural safety can be defined as[1].

- 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 healthcare professionals and healthcare 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.

1. 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 healthcare resources responsibly in everyday practice.

Entrustable Professional Activities

Entrustable Professional Activities (EPAs) 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 in care**	Manage the transition of patient care between health professionals, providers, and contexts
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
10	**Prescribing**	Prescribe therapies tailored to patients' needs and conditions
11	**Procedures**	Plan, prepare for, perform, and provide aftercare for important practical procedures
12	**Investigations**	Select, organise, and interpret investigations
13	**Clinic management**	Manage an outpatient clinic
14	**End-of-life care**	Manage the care of patients at the end of their lives

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 • recognise 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 healthcare 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, families, carers, and other health professionals to resolve conflict that may arise when planning and aligning goals	• communicate adequately with colleagues • communicate adequately with patients, families, carers, and/or the public • respect the roles of team members

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

	• demonstrate rapport with people at all levels by tailoring messages to different stakeholders	
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 their 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 competent 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 • demonstrate understanding of the ethics of resource allocation by aligning optimal patients and organisational care • acknowledge personal conflicts of interest and unconscious bias	• 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

	• effectively consult with stakeholders, achieving a balance of alternative views • act collaboratively to resolve behavioural incidents and conflicts such as harassment and bullying	• demonstrate 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	• recognise 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 health care • advocate for the resources and support for healthcare 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 • demonstrate understanding of 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 learners 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[5], such as younger or older people, and different populations	• demonstrate accessible, supportive, and compassionate behaviour

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

	• support learners to deliver clear, concise, and relevant information in both verbal and written communication • listen and convey information clearly and considerately	
Quality and safety	• support learners to deliver quality care while maintaining their own wellbeing • apply lessons learnt 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	• observe learners to reduce risks and improve health outcomes
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 assessment • 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 learners' needs • implement teaching and learning activities that are misaligned to learning goals • adopt a teaching style that discourages learner self-directedness
Research	• clarify junior colleagues' research project goals and requirements, and provide feedback regarding the merits or challenges of proposed research	• guide learners with respect to the choice of research projects • ensure that the research projects planned are feasible and of suitable standards

	• monitor the progress of learners' research projects regularly, and may review research projects prior to submission • support learners to find forums to present research projects • encourage and guide learners to seek out relevant research to support practice	
Cultural safety	• role model a culturally appropriate approach to teaching • encourage learners to seek out opportunities to develop and improve their own cultural safety • encourage learners to consider culturally appropriate care of Aboriginal and Torres Strait Islander peoples and Māori into patients' management • consider cultural, ethical, and religious values and beliefs in teaching and learning	• function effectively and respectfully when working 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 • create an inclusive environment in which 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

	• help shape organisational culture to prioritise quality and work safety through openness, honesty, shared learning, and continued improvement	
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 • support innovation in teaching and training	• incompletely integrate public health principals into teaching and practice

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 • adhere to best practice guidelines • audit clinical guidelines and outcomes • contribute to the development of policies and protocols designed to protect patients[6] and enhance health care • monitor one's own practice and develop individual improvement plans.	
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	• 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 • support patients to share decision making about their own health care, to the extent they choose • assist patients' access to their health information, as well as complaint and feedback systems	• demonstrate awareness of the evidence for consumer engagement and its contribution to quality improvement in care • apply knowledge of how health literacy might affect the way patients or populations gain access to, understand, and use health information

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

	• discuss with patients any safety and quality concerns they have relating to their care • implement the organisation's open disclosure policy	
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 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 care	• be cognisant of a systematic approach to improving the quality and safety of health care
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	• 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	• 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	• recognise 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
Cultural safety	• 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	• analyse and evaluate current care processes to improve care • use decision-making support tools, such as guidelines, protocols, pathways, and reminders	• 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 to lower patients' risk of harm, and promote interdisciplinary programs of education • 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
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 education and training » defining the scope of clinical practice » performance monitoring and management » safety and quality education and training	• maintain a dialogue with service managers about issues that affect patients' 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[7] • obtain patient histories • 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	• plan both open and directed questions to obtain relevant data • determine histories of presenting problems, incorporating the patients' developmental stage, including: » associated symptoms » duration and course of the condition » symptom onset • elicit key features of histories, including: » behavioural » developmental milestones » family » growth » neurological » perinatal » prenatal » psychosocial and general medicine history, including: o alcohol o drugs o immunisation » sleep • adapt examination methods depending on the behavioural and cognitive state of the patient	• take patient-centred histories, considering psychosocial factors • perform accurate physical examinations • recognise and correctly interpret abnormal findings • synthesise pertinent information to direct clinical encounters and diagnostic categories • develop appropriate management plans

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

- perform various examination techniques, suitable to the neurodevelopmental stage of patients, to assess:
  - » cognition / mental state
  - » coordination and gait
  - » cranial nerves
  - » motor function
  - » reflexes
  - » sensory function
- synthesise and interpret findings from histories, examinations, and investigations to devise the most likely provisional diagnoses via reasonable differential diagnoses
- assess the severity of problems, the likelihood of complications, and clinical outcomes
- plan necessary investigations within an appropriate time frame
- review significant investigations, such as MRI and nuclear medicine electrophysiology
- reconsider and, if necessary, revise a diagnosis when new information becomes available
- develop management plans based on relevant guidelines, and consider the balance of benefit and harm by taking patients' personal sets of circumstances into account
- obtain further details from other sources, such as home video, other family members, paediatricians, and teachers
- identify mental health issues and refer appropriately
- assess and manage problems of patients' adherence to management
- identify state / national driving regulations for neurological conditions, and provide guidance in relation to an individual's fitness to drive
- recognise signs of inflicted injury
- assess patients' level of consciousness using a tool such as the Glasgow Coma Scale, and explain the limitations of these in childhood
- apply and interpret brain death criteria

	• assess sleep using scores such as the Epworth Sleepiness Scale for Children and Adolescents (ESS-CHAD), and explain the limitations of these measures • recognise the signs of child abuse and domestic violence • assess patients' capacity and competence to make informed decisions regarding treatment options	
Communication	• communicate openly, listen, and take patients' concerns seriously, giving them adequate opportunity to ask questions • provide information to patients and their family and/or carers 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 • include the child / adolescent in the process of information gathering • describe to the child and family and/or carers the potential negative impacts of investigations involving neuroimaging and genetic testing • communicate with hospital managers and, if necessary, insurers, lawyers, or other interested parties to provide successful advocacy for patients or services delivering care to patients • provide appropriate written reports to third parties • involve nursing staff to provide teaching and a link to the treating doctor	• anticipate, read, and respond to verbal and nonverbal cues • demonstrate active listening skills • communicate patients' situations to colleagues, including senior clinicians
Quality and safety	• demonstrate safety skills, including infection control, adverse event reporting, and effective clinical handover • obtain informed consent before undertaking any investigation or providing treatment (except in an emergency) • ensure patients are informed of the material risks associated with any part of proposed management plans	• perform hand hygiene, and take infection control precautions at appropriate moments • take precaution against assaults from confused or agitated patients, ensuring appropriate care of patients • document history and physical examination findings, and synthesise with clarity and completeness

	• recognise and effectively deal with aggressive and violent patient behaviours through appropriate training	
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 • obtain informed consent before involving patients in teaching activities • turn clinical activities into an opportunity to teach, appropriate to the setting	• set unclear goals and objectives for self-learning • self-reflect infrequently • deliver teaching considering learners' level of training
Research	• search for, find, compile, analyse, interpret, and evaluate information relevant to the research subject • access information from neurogenetic databases, such as Online Mendelian Inheritance in Man (OMIM)	• refer to guidelines and medical literature to assist in clinical assessments when required • demonstrate awareness 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 competent communication and care for Aboriginal and Torres Strait Islander peoples and Māori, 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' beliefs and values, and how these might impact on health	• display respect for patients' cultures, and attentiveness to social determinants of health • demonstrate awareness 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 a proxy decision maker appropriately	• demonstrate professional conduct, honesty, and integrity • consider patients' decision-making capacity • identify patients' preferences regarding management and the role of families in decision making • not advance personal interest or professional agendas at the expense of patient or social welfare

Judgement and decision making	• apply knowledge and experience to identify patients' problems, making logical, rational decisions, and acting to achieve positive outcomes for patients • use a holistic approach to health, considering comorbidity, risk, and uncertainty • use the best available evidence for the most effective therapies and interventions to ensure quality care • recognise how and when to access additional resources and/or to refer patients to other neurologists, general paediatricians, neurosurgeons, rehabilitationists, or other specialist physicians	• demonstrate clinical reasoning by gathering focused information relevant to patients' 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 outcomes for patients • demonstrate awareness of colleagues in difficulty, and work within the appropriate structural systems to support them while maintaining patients' safety	• share relevant information with members of the healthcare 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 • provide support with respect to education • identify community services for children with disabilities or other chronic neurological conditions	• 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 in care

Theme	Management of transitions in care	
Title	**Manage the transition of patient care between health professionals, providers, and contexts**	
Description	This activity requires the ability to: • manage transitions of patient care to ensure the optimal continuation of care between providers • identify the appropriate care providers and other stakeholders with whom to share patient information • exchange pertinent, contextually appropriate, and relevant patient information • perform this activity in multiple settings, appropriate to the speciality, including ambulatory, critical care, and 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	• facilitate optimal transitions of care for patients • identify and manage key risks for patients during transition • anticipate possible changes in patients' conditions, and provide recommendations on how to manage them • encourage a process for adolescents to learn the skills of independence and self-management from their early teens, and provide adequate planning for the transition to adult care	• demonstrate awareness of the details of patients' conditions, illness severity, and potential emerging issues, with appropriate actions • provide accurate summaries of patients' information with accurate identification of problems or issues
Communication	• communicate with patients[8], families, and/or carers about transitions of care, and engage and support these parties in decision making • write relevant and detailed medical record entries, including clinical assessments and management plans • write comprehensive and accurate summaries of care, including discharge summaries, clinic letters, and transfer documentation	• communicate clearly with clinicians and other caregivers • use standardised verbal and written templates to improve the reliability of information transfer and prevent errors and omissions • communicate accurately and in a timely manner to ensure effective transitions between settings, and continuity and quality of care

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

	• initiate and maintain verbal communication with other health professionals, when required	
Quality and safety	• identify patients at risk of poor transitions of care, and mitigate this risk • use electronic tools (where available) to securely store and transfer patient information • use consent processes, including written consent if required, for the release and exchange of information • recognise the medicolegal context of written communications	• ensure that handover is complete, or work to mitigate risks if incomplete • ensure all outstanding results or procedures are followed up by receiving units and clinicians • keep patients' information secure, adhering to relevant legislation regarding personal information and privacy
Teaching and learning	• integrate clinical education in handover sessions and other transition of care meetings • tailor clinical education to the level of the professional parties involved	• take opportunities to teach junior colleagues during handover, as necessary
Cultural safety	• communicate with careful consideration to health literacy, language barriers, and culture regarding patient preferences, and whether they are realistic and possible, respecting patient choices • recognise the timing, location, privacy, and appropriateness of sharing information with patients and their families or carers	• include relevant information regarding patients' cultural or ethnic background in handovers, and whether an interpreter is required
Ethics and professional behaviour	• disclose and share only contextually appropriate medical and personal information • recognise the clinical, ethical, and legal rationale for information disclosure • share information about patients' care in a manner consistent with privacy law and professional guidelines on confidentiality • be able to explain the additional complexity related to some types of information, such as genetic information and blood-borne virus status, and seek appropriate advice about disclosure of such information • interact in a collegiate and collaborative way with professional colleagues during transitions of care	• maintain respect for patients, families, carers, and other health professionals, including respecting privacy and confidentiality

Judgement and decision making	• ensure patients' care is in the most appropriate facility, setting, or provider	• use a structured approach to consider and prioritise patients' issues • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• share the workload of transitions of care appropriately, including delegation • recognise the medical governance of patient care, and the differing roles of team members • show respect for the roles and expertise of other health professionals, and work effectively as a member of professional teams • ensure that multidisciplinary teams provide the opportunity for patients' engagement and participation when appropriate	• recognise factors that impact transfers of care, and help subsequent health professionals understand the issues to continue care • work to overcome the potential barriers to continuity of care, appreciating the role of handover in overcoming these barriers
Health policy, systems, and advocacy	• contribute to processes for managing risks, and identify strategies for improvement in transition of care • engage in organisational processes to improve transitions of care, such as formal surveys or follow-up phone calls after hospital discharge • identify any local services available, and advocate for the provision of services within the paediatric and adult sector to facilitate the development of transition services	• factor transport issues and costs to patients into arrangements for transferring patients to other settings

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 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[9], and respond appropriately • perform advanced life support, according to resuscitation council guidelines, to a high level of advanced resuscitation skills • demonstrate knowledge of potential risks and complications of resuscitation • effectively assess, diagnose, and manage acute undifferentiated clinical presentations • select investigations that ensure maximum patient safety through excluding or diagnosing critical patient issues • systematically identify causes of acute deterioration in health status and levels of physical and cognitive functioning • provide plans for ongoing monitoring / transfer to high-dependency units after initial stabilisation • manage escalations or transitions of care in a proactive and timely manner	• recognise seriously unwell patients requiring immediate care • apply basic life support as indicated • recognise 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

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

	• develop plans of multidisciplinary treatment, rehabilitation, and secondary prevention following acute events • provide clear and effective discharge summaries with recommendations for ongoing care • optimise medical management before, during, and after operations	
Communication	• communicate clearly with other team members, and coordinate efforts of multidisciplinary team members • use closed-loop and clear communication with other healthcare team members during resuscitation • facilitate early communication with patients, families, and healthcare team members to allow shared decision making • negotiate realistic treatment goals, and determine and explain the expected prognoses and outcomes • employ communication strategies appropriate for younger patients or those with cognitive difficulties • explain situations 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 • if possible, 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 • 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	• evaluate the quality of processes through well-designed audits • recognise the risks and benefits of operative 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

	• coordinate and encourage innovation, and objectively evaluate improvement initiatives for outcomes and sustainability	
Teaching and learning	• demonstrate effective supervision skills and teaching methods 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 healthcare teams to reflect on encounters and improve future patients' care	• 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 wards • consider simulation-based teaching
Research	• select studies based on optimal trial design, freedom from bias, and precision of measurement • evaluate the value of treatments in terms of relative and absolute benefits, cost, 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 awareness of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• negotiate health care decisions in a culturally appropriate way by considering variation in family structures, cultures, religion, or belief systems • adopt appropriate means of communication with culturally and linguistically diverse (CALD) populations • integrate culturally appropriate care of Aboriginal and Torres Strait Islander peoples and Māori into patients' management • consider cultural, ethical, and religious values and beliefs in leading multidisciplinary teams	• practise cultural competency appropriate for the community serviced • proactively identify barriers to healthcare access
Ethics and professional behaviour	• develop management plans based on medical assessments of the clinical conditions and multidisciplinary assessments of functional capacity • consider the consequences of delivering treatment that is deemed futile, directing to other care as appropriate	• 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

	• advise patients of their rights to refuse medical therapy, including life-sustaining treatment • facilitate interactions within multidisciplinary teams that respect values, encourage involvement, and engage all participants in decision making • demonstrate critical reflection on personal beliefs and attitudes, including how these may affect patient care and health care policy	
Judgement and decision making	• recognise the need for escalations 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 • manage the transition of acute medical patients through their hospital journeys • lead a team by providing engagement while maintaining a focus on outcomes	• collaborate with and engage other team members, based on their roles and skills • ensure appropriate multidisciplinary assessment and management • encourage an environment of openness and respect to lead effective teams
Health policy, systems, and advocacy	• use a considered and rational approach to the responsible use of resources, balancing costs against outcomes • prioritise patients' care based on need, and consider available resources • collaborate with emergency medicine staff and other colleagues to develop policies and protocols for the investigation and management of common acute medical problems	• demonstrate understanding of the systems for the escalation of care for deteriorating patients • acknowledge 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[10], families, and/or carers • manage chronic and advanced conditions, comorbidities, complications, and disabilities • collaborate with other health care providers • ensure continuity of care • facilitate patients' and/or families' and/or carers' 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 The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity 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	• communicate effectively and at an appropriate level with patients and their families regarding agreed care plans • encourage patients' self-management through education to take greater responsibility for their care, and support problem solving • encourage patients' access to self-monitoring devices and assistive technologies	• provide healthy lifestyle advice and information to patients on the importance of self-management • work in partnership with patients, and motivate them to comply with agreed care plans • involve local clinicians and therapists in day-to-day care as needed

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

	• communicate with multidisciplinary team members, and involve patients in that dialogue	
Quality and safety	• use innovative models of chronic disease care, using telehealth and digitally integrated support services • review medicine use, and ensure patients understand safe medication administration to prevent errors • support patients' self-management by balancing between minimising risk and helping them become more independent • participate in quality improvement processes impacting on patients' abilities to undertake normal activities of daily living • participate in departmental quality and safety meetings, such as mortality and morbidity and multidisciplinary team meetings	• participate in continuous quality improvement processes and clinical audits on chronic disease management • 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 • support and educate junior team members in day-to-day clinical duties • educate patients to recognise and monitor their symptoms, and undertake strategies to assist their recovery • use evidence-based resources to support patient care plan development	• use clinical practice guidelines for chronic diseases management • seek feedback and information on ward rounds to improve own knowledge base • demonstrate awareness of evidence-based resources to support clinical decision making
Research	• prepare reviews of literature on patients' encounters to present at journal club meetings or peer reviewed meetings • search for and critically appraise evidence to resolve clinical areas of uncertainty	• search literature using problem / intervention / comparison / outcome (PICO) format • recognise appropriate use 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 professional guidelines on confidentiality • use consent processes for the release and exchange of health information	• share information between relevant service providers, consistent with privacy laws and confidentiality guidelines • acknowledge and respect the contribution of health professionals involved in patients' care

	• assess patients' decision-making capacity, and appropriately identify and use proxy decision makers	
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 • delegate clinical duties appropriate to other team members' levels of training and ability	• 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 improve patients' quality of life • help patients access initiatives and services for patients with chronic diseases and disabilities	• demonstrate 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**	
Description	This activity requires the ability to: • select suitable contexts, and include family and/or carers and other team members • adopt a patient-centred perspective, including adjusting for cognition and disabilities • select and use appropriate modalities and communication strategies, including appropriate strategies and materials for culturally and linguistically diverse populations (CALD) • structure conversations intentionally • negotiate mutually agreed management plans • verify patients'[11], family members', or carers' understanding of information conveyed • develop and implement plans to ensure actions occur • ensure conversations are 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	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	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 and investigations, and give them adequate opportunity to question or refuse interventions and treatments • seek to understand the concerns and goals of patients, and plan management in partnership with them • present the following patient information verbally and document in written form: » diagnoses or differential diagnoses » key clinical findings of histories and examinations » proposed management plans » results of investigations	• apply knowledge of the scientific basis of health and disease to the management of patients • demonstrate awareness of the clinical problems being discussed • formulate management plans in partnership with patients

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

	• provide information to patients to enable them to make informed decisions about diagnostic, therapeutic, and management options	
Communication	• use appropriate communication strategies and modalities for communication, such as emails, face-to-face, or phone calls • elicit patients' views, concerns, and preferences, promoting rapport • 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 such as diagnoses, prognoses, and management plans considerately and sensitively to patients and their families, seeking clarification if unsure of how best to proceed • treat children and young people respectfully, and listen to their views • recognise the role of family or carers, and, when appropriate, encourage patients to involve their family or carers in decisions about their care • practice gender inclusive care and promote equality	• select appropriate modes of communication • engage patients in discussions, avoiding the use of jargon • check patients' understanding of information • 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, self-harm, or elder abuse • participate in processes to manage patients' complaints	• inform patients of the material risks associated with proposed management plans • treat information about patients as confidential

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	• respond appropriately to information sourced by patients, and to patients' knowledge regarding their condition
Research	• provide information to patients that is based on guidelines issued by the National Health and Medical Research Council and/or Health Research Council of New Zealand • 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 awareness of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• demonstrate effective and culturally competent communication with Aboriginal and Torres Strait Islander peoples and Māori • effectively communicate with members of other cultural groups by meeting patients' specific language, cultural, and communication needs • use qualified language or cultural interpreters to help meet patients' communication needs • provide plain language and culturally appropriate written materials to patients when 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 • encourage and support patients and, when relevant, their families or carers, in caring for themselves and managing their health • demonstrate respectful, professional relationships with patients • 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	• respect the preferences of patients • communicate appropriately, consistent with the context, and respect patients' needs and preferences • maximise patient autonomy, and support their decision making • avoid sexual, intimate, and/or financial relationships with patients • demonstrate a caring attitude towards patients • 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 • respect patients, including understanding and protecting their rights to privacy and confidentiality
Leadership, management, and teamwork	• communicate effectively with team members involved in patients' care, and with patients, families, and carers • discuss medical assessments, treatment plans, and investigations with patients and primary care teams, working collaboratively with all • discuss patients' care needs with healthcare team members to align them with the appropriate resources • facilitate an environment in which all team members feel they can contribute and their opinion is valued • communicate accurately and succinctly, and motivate others on the healthcare team	• answer questions from team members • summarise, clarify, and communicate responsibilities of healthcare team members • keep healthcare 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	• 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, benefits, comorbidities, potential drug interactions, and risks • communicate with patients[12], families, and/or carers about the benefits and risks of proposed therapies • provide instructions on medication administration effects and side effects • 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, allergies, chronic disease status, lifestyle factors, patient preference, and potential drug interactions prior to prescribing new medications • plan for 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 conditions accurately, appropriately, and safely • demonstrate awareness of the benefits, contraindications, dosage, drug interactions, rationale, risks, and side effects • identify and manage adverse events
Communication	• discuss and evaluate the benefits, rationale, and risks of treatment options, making decisions in partnership with patients • write clear and legible prescriptions in plain language, and include specific indications for the anticipated duration of therapy • describe how the medication should and should not be administered, including any important relationships to food, time of day, and other medicines being taken	• 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

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

	• educate patients about the expected outcomes, intended use, 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 • ensure patients' understanding by repeating back pertinent information, such as when to return for monitoring and whether therapy continues after this single prescription • identify patients' concerns and expectations, and explain how medicines might affect their everyday lives	• 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 • 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, including an approach to polypharmacy and prescribing cascade • report suspected adverse events to the Advisory Committee on Medicines, and record it in patients' medical records	• check the dose before prescribing • monitor side effects of medicines prescribed • identify medication errors and institute appropriate measures • use electronic prescribing systems safely • rationalise medicines to avoid polypharmacy
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 • reflect on prescribing, and seek feedback from a supervisor

Research	• critically appraise research material to ensure any new medicine improves patient-oriented outcomes more than older medicines, and not just more than placebo • 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
Cultural safety	• explore patients' understanding of and preferences for non-pharmacological and pharmacological management • 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	• recognise patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of non-pharmacological and pharmacological management approaches
Ethics and professional behaviour	• provide information to patients about prescribed medicines and: » how to take the medicine » potential side effects » what the medicine does » what the medicine is for » when the medicine should be stopped • make prescribing decisions based on good safety data when the benefits outweigh the risks involved • recognise the ethical implications of pharmaceutical industry-funded research and marketing	• 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 select 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 • 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: » contraindications » cost to patients, families, and the community » funding and regulatory considerations » generic versus brand medicines » interactions » risk-benefit analysis

	• 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 • adhere to published principles or medically accepted guidelines when off-label prescribing	
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 allergies, current medicines, history, and preferences, ensuring that resources are used wisely for the benefit of patients	• prescribe in accordance with the organisational policy

Learning goal 11: Procedures

Theme	Procedures	
Title	**Plan, prepare for, perform, and provide aftercare for important practical procedures**	
Description	This activity requires the ability to: • select appropriate procedures in partnership with patients[13], their families, and/or carers • obtain informed consent • set up the equipment, maintaining an aseptic field • perform procedures • manage unexpected events and complications during and after procedures • provide aftercare for patients • communicate aftercare protocols and instructions to patients and medical and nursing staff • interpret the results and outcomes of procedures, including imaging and pathology reports • communicate the outcome of procedures and associated investigations to patients • perform this activity across multiple relevant settings • plan follow-up investigations.	
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	• select procedures by assessing patient-specific factors, including alternatives, benefits, and risks • confidently and consistently perform a range of common procedures • ensure team members are aware of all allergies and adverse reactions identified, and take precautions to avoid allergies and adverse reactions during procedures • ensure patients have complied with preprocedural preparation • confirm the correct position / site / side / level on patients for planned procedures • recognise and manage effectively complications arising during or after procedures	• 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 postprocedural review of patients

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

	• recognise and correctly interpret normal and abnormal findings of diagnostic procedures • interpret results in context of patients, and relay information to patients and their family • perform a lumbar puncture (LP)	
Communication	• accurately document procedures in the clinical notes, including informed consent, procedures requested and performed, reasons for procedures, medicines given, aseptic technique, and aftercare • explain procedures clearly to patients, families, and carers, including reasons for procedures, potential alternatives, and possible risks, to facilitate informed choices • counsel patients sensitively and effectively, and support them to make informed choices • address patients', families', or carers' concerns relating to procedures, providing opportunities to ask questions • tailor language according to individual patients' age and capacity to understand • communicate effectively with team members, patients, families, and carers prior to, during, and after procedures • ensure team members are confident and competent in their assigned roles	• explain the process of procedures to patients without providing a broader context • help patients, families, and carers choose procedures • communicate with members of procedural teams so all team members understand who each member is • discuss postprocedural care with patients, families, and carers • complete relevant patients' documentation, and conduct appropriate clinical handovers
Quality and safety	• obtain informed consent or other valid authority before undertaking any procedure • set up all necessary equipment, and consistently use universal precautions and aseptic technique • confirm patients' identification, verify the procedure and, where appropriate, the correct position / site / side / level for the procedure • ensure that information on patients' consent forms matches procedures to be performed • identify, document, and appropriately notify of any adverse events or equipment malfunction	• provide information in a manner so that patients, families, and carers are fully informed when consenting to any procedures • demonstrate an inconsistent application of aseptic technique • identify patients using approved patients' identifiers before any treatment or intervention is initiated
Teaching and learning	• refer to and/or be familiar with relevant published procedural guidelines prior to undertaking procedures	• participate in continued professional development • help junior colleagues develop new skills

	• organise or participate in in-service training on new technology • provide specific and constructive feedback and comments to junior colleagues • initiate and conduct skills training for junior staff	• actively seek feedback on personal technique until competent
Cultural safety	• consider individual patients' cultural perception of health and illness, and adapt practice accordingly	• respect religious, cultural, linguistic, and family values and differences
Ethics and professional behaviour	• confidently perform common procedures • identify appropriate proxy decision makers when required • show respect for the knowledge and expertise of colleagues • maximise patient autonomy in decision making	• perform procedures when adequately supervised • follow procedures to ensure safe practice
Judgement and decision making	• identify roles and optimal timing for diagnostic procedures • critically appraise information from the assessment and evaluation of risks and benefits to prioritise patients on waiting lists • make clinical judgements and decisions based on the available evidence • select the most appropriate and cost-effective diagnostic procedures • adapt procedures in response to assessments of risks to individual patients • select appropriate investigations on the samples obtained in diagnostic procedures	• prioritise which patients receive procedures first (if there is a waiting list) • assess personal skill levels, and seek help with procedures when appropriate • use tools and guidelines to support decision making • recommend suboptimal procedures for patients
Leadership, management, and teamwork	• explain critical steps, anticipated events, and equipment requirements to teams on planned procedures • provide staff with clear aftercare instructions, and explain how to recognise possible complications • identify relevant management options with colleagues, according to their level of training and experience, to reduce errors, prevent complications, and support efficient teamwork • coordinate efforts, encourage others, and accept responsibility for work done	• ensure all relevant team members are aware that a procedure is occurring • discuss patients' management plans for recovery with colleagues

Health policy, systems, and advocacy	• discuss serious incidents at appropriate clinical review meetings • initiate local improvement strategies in response to serious incidents • use resources efficiently when performing procedures	• perform procedures in accordance with the organisational guidelines and policies

Learning goal 12: Investigations

Theme	Investigations	
Title	**Select, organise, and interpret investigations**	
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 • work in partnership with patients[14], their families and/or carers, to facilitate choices that are right for them • provide aftercare for patients (if needed) • interpret the results and outcomes of investigations • communicate the outcome of investigations to 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 The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• choose evidence-based investigations, and frame them as an adjunct to comprehensive clinical assessments • assess patients' concerns, and determine the need for specific tests that are likely to result in overall benefit • develop plans for investigations, identifying their roles and timing • recognise and correctly interpret abnormal findings, considering patients' specific circumstances, and act accordingly • interpret results from psychological and developmental assessment tools for infants, children, and young people • perform and correctly report basic nerve conduction studies (NCS), such as studies for carpal tunnel syndrome, other common entrapment neuropathies, and peripheral neuropathy • use EEG, brain imaging, and video monitoring • formulate plans to investigate the underlying aetiology of epilepsy and other conditions	• provide rationale for investigations • recognise the significance of abnormal test results, and act on these • consider patient factors and comorbidities • consider age-specific reference ranges

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

Communication	• explain to patients the potential benefits, burdens, costs, risks, 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 understand the information they have been given and whether they need more information before proceeding with investigations • 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, families, and carers • give information that patients may find distressing in a considerate way	• discuss the benefits, complications, indications, and risks 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
Quality and safety	• identify adverse outcomes that may result from proposed investigations, focusing on patients' individual situations	• consider safety aspects of investigations when planning them • seek help with interpretation of test results for less common tests or indications or unexpected results
Teaching and learning	• use appropriate guidelines, evidence sources, and decision support tools • participate in clinical audits to improve test ordering strategies for diagnoses and screening	• undertake professional development to maintain currency with investigation guidelines
Research	• provide patients with relevant information if a proposed investigation is part of a research program • obtain written consent from patients if the investigation is part of a research program	• refer to evidence-based clinical guidelines • consult current research on investigations
Cultural safety	• acknowledge patients' views and preferences about any proposed investigations 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
Ethics and professional behaviour	• remain within the scope of the authority given by patients (with the exception of emergencies)	• choose not to investigate in situations where it is not appropriate for ethical reasons

	• discuss with patients how decisions will be made once the investigation has started and the patient is not able to participate in decision making • respect patients' decisions to refuse investigations, even if their decisions may not be appropriate or evidence based • advise patients there may be additional costs, which patients may wish to clarify before proceeding • explain the expected benefits as well as the potential burdens and risks of any proposed investigations before obtaining informed consent or other valid authority • demonstrate awareness of complex issues related to genetic information obtained from investigations, and subsequent disclosure of such information	• identify appropriate proxy decision makers when required • practise within current ethical and professional frameworks • practise within own limits, and seek help when needed • involve patients in decision making regarding investigations, obtaining the appropriate informed consent, including financial consent, if necessary
Judgement and decision making	• evaluate the benefits, costs, and potential risks of each investigation in clinical situations • adjust the investigative path depending on test results received • consider whether patients' conditions may get worse or better if no tests are selected	• choose the most appropriate investigations for clinical scenarios in discussion with patients • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• consider the role other members of the healthcare team might play, and what other sources of information and support are available • ensure results are checked in a timely manner, taking responsibility for following up results	• demonstrate awareness of what parts of an investigation are provided by different doctors or health professionals
Health policy, systems, and advocacy	• select and justify investigations regarding the pathological basis of disease, appropriateness, cost effectiveness, safety, and utility • consider resource use through peer review of testing behaviours	

Learning goal 13: Clinic management

Theme	Clinic management	
Title	**Manage an outpatient clinic**	
Description	This activity requires the ability to: • manage medical procedures, investigations, and treatments • manage clinic services • oversee quality improvement activities • communicate with patients[15], their families, and/or carers • 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 the clinical notes or as part of ambulatory care reviews • update documentation in a timeframe appropriate to the clinical situation of patients	• demonstrate awareness 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 community health centres and consumer organisations • link patients to specific community-based health programs and group education programs	• wherever practical, meet patients' specific language and communication needs • facilitate the appropriate use of interpreter services and translated materials
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	• take reasonable steps to address issues if patients' safety may be compromised • participate in organisational quality and safety activities, including clinical incident reviews

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

	• identify aspects of service provision that may be a risk to patients' safety • ensure that patients are informed about fees and charges	• demonstrate awareness of a systematic approach to improving the quality and safety of health care
Teaching and learning	• evaluate their own professional practice • demonstrate learning behaviour and skills in educating junior colleagues • contribute to the generation of knowledge • 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 or other valid authority before involving patients in research • inform patients about their rights, the purpose of the research, procedures to be undergone, and potential risks and benefits of participation before obtaining consent	• allow patients to make informed and voluntary decisions to participate in research
Cultural safety	• apply knowledge of the cultural needs of the community serviced, and how to shape service to those people • mitigate the influence of own culture and beliefs on interactions with patients and decision making • adapt practice to improve patient engagement and health outcomes	• acknowledge the social, economic, cultural, and behavioural factors influencing health, both at individual and population levels
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 awareness of financial and other conflicts of interest	• recognise 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
Judgement and decision making	• 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	• demonstrate awareness of the appropriate use of diagnostic interventions, human resources, 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 • 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 • support colleagues who raise concerns about patients' safety	• attend relevant clinical meetings regularly
Health policy, systems, and advocacy	• demonstrate 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 • apply the principles of efficient and equitable allocation of resources to meet individual, community, and national health needs	• recognise common population health screening and prevention approaches

Learning goal 14: End-of-life care

Theme	End-of-life care	
Title	**Manage the care of patients at the end of their lives**	
Description	This activity requires the ability to: • recognise the dying phase • support patients[16] to plan for their advance care, and document their own wishes • manage end-of-life care plans.	
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	• accurately assess patients' physical and psychological symptoms • estimate prognosis and communicate this appropriately, if requested, including the uncertainties around such estimates • develop and clearly document individualised end-of-life care plans, including patients' preferences for treatment options, resuscitation plans, preferred place of care, and preferred place of death • provide holistic symptom management, focusing on psychological and physical distress, according to patients' wishes • avoid unnecessary investigations or treatments, ensuring physical and psychosocial support • review the goals of care and treatment plans with patients, families, and/or carers if significant changes in patients' conditions or circumstances occur • recognise and manage the terminal phase in a timely way • refer to and involve other services, such as palliative care teams, in a timely manner	• demonstrate awareness of the principles of care for patients at the end of their lives • provide timely assessment, and document patients' care plans • manage physical symptoms in alignment with patients' wishes • take steps to alleviate patients' symptoms and distress • correctly identify patients approaching the end of life, and provide symptomatic treatment • adequately manage patients in their terminal phase • recognise the role of the palliative care physician, and when referral is appropriate

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

	• discuss issues with patients and/or caregivers, and consult with patients and/or caregivers to determine management plans that prevent suffering • manage symptoms such as anxiety, dyspnoea, and pain	
Communication	• establish supportive relationships with patients, families, and/or carers based on understanding, trust, empathy, and confidentiality • explore patients' concerns across physical, spiritual, cultural, and psychological domains thoughtfully • identify opportunities to discuss end-of-life care, aligning it with patients' values and preferences • identify proxy decision makers patients want involved in discussions about their end-of-life care • identify and document lists of close family members or carers, and develop support plans for them • provide bereaved families or carers with written information about access to bereavement support • communicate effectively and in a timely manner with other health professionals involved in patients' care	• discuss with patients, families, and/or carers the goals of care and treatment, and document this in patients' clinical records • ensure consistent messages are given to patients, families, and/or carers about treatment options, their likelihood of success, risks, and prognosis • provide honest and clear clinical assessment summaries of situations, using plain language and avoiding medical jargon • discuss with families and/or carers the availability of appropriate support and bereavement care
Quality and safety	• conduct medication chart safety audits and multidisciplinary mortality and morbidity meetings, and provide feedback to colleagues • develop monitoring and evaluation strategies to capture feedback about the quality of care from multidisciplinary team members, patients, families, and carers • review all deaths to determine the safety and quality of patients' end-of-life care and how it could be improved • review technological systems and processes that support safe and high-quality end-of-life care	• collect and review data on the safety and effectiveness of end-of-life care delivery • communicate the content of discussions about prognoses and advance care planning to multidisciplinary teams • ensure that actual care is aligned with patients' documented wishes
Teaching and learning	• ensure all members of multidisciplinary teams receive education on their roles and responsibilities for managing end-of-life care	• participate in education on disease-specific symptom assessment and evidence-based symptom management

	• provide supervision, support, and teaching to develop the skills of junior colleagues on end-of-life care • reflect on personal practice, and use this process to guide continuing professional development • promote education covering: » competencies for providing culturally responsive end-of-life care to Aboriginal and Torres Strait Islander peoples and Māori, and to people from other cultural backgrounds » ethical and medicolegal issues » relevant legislation in the state, territory, or region	• participate in upskilling in best practice of end-of-life care management • encourage junior colleagues to participate in multidisciplinary case reviews, mortality and morbidity meetings, and adverse event reviews
Research	• ensure that quality end-of-life care management processes are evidence based and outcome focused • use systematic reviews or personal reviews and appraisal of literature as evidence for the appropriate management • support clinical trials to build the end-of-life care evidence base	• recognise that the evidence may be insufficient to resolve uncertainty and make definitive decisions
Cultural safety	• practise culturally responsible medicine based on understanding the personal, historical, and cultural influences on patients, families, and carers • develop strategies for identifying culturally appropriate decision makers, and obtain their input in discussions of patients' end-of-life care • offer support to patients, families, and/or carers to include cultural or religious practices in their care	• recognise, respect, and respond to individual preferences and needs of patients, regardless of their culture and religious beliefs • support patients, families, and carers with communication difficulties associated with cultural and linguistic diversity
Ethics and professional behaviour	• ensure all team members discuss end-of-life care with patients, and act on expressed patient preferences • enhance the quality of life for patients at the end of life to minimise pain and suffering caused by ineffective treatments • recognise the complexity of ethical issues related to human life and death when considering the allocation of scarce resources • recognise feelings of moral distress and burnout in themselves and colleagues	• ensure that information on advance care plans, treatment plans, goals of care, and patients' treatment preferences is available to all involved in patients' care • ensure patients' dignity is preserved • respond appropriately to distress or concerns of colleagues, patients, families, and carers

Judgement and decision making	• maximise patients' autonomy and their best interests when making treatment decisions • liaise with other relevant services, providing referrals as necessary	• define and document patients', families', and/or carers' goals and agreed outcomes
Leadership, management, and teamwork	• ensure care plans are communicated to all teams involved in patients' care, including relevant community care providers • define the responsibilities and roles of team members involved in patients' care • achieve agreement between multidisciplinary teams about patients' treatment options • coordinate care and support to be provided in patients' preferred place of care • effectively manage personal challenges of dealing with death and grief	• coordinate end-of-life care to minimise fragmentation of care • document multidisciplinary care plans, including the terminal phase
Health policy, systems, and advocacy	• participate in developing frameworks for organisational advance care planning • allocate resources according to the organisational strategic plan to support systems for effective delivery of end-of-life care • advocate for the needs of individual patients, social groups, and cultures within the community who have specific palliative care needs or inequitable access to palliative care services	• allocate scarce resources effectively • support community-based service providers to build capacity for people to be cared for in their preferred place of death

Knowledge Guides

Knowledge guides (KGs) 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
15	Scientific foundations of paediatric neurology
16	Congenital malformation disorders
17	Developmental delay and regression
18	Pain, including headaches, facial pain, and sensory loss
19	Disorders of consciousness and sleep
20	Paroxysmal disorders, including seizures, syncope, and stroke
21	Disorders of vision and other senses
22	Weakness and disorders of speech, language, and swallowing
23	Disorders of gait and balance, including vertigo, dizziness, and disequilibrium
24	Movement disorders
25	Neonatal neurology

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

Advanced Trainees will have in-depth knowledge of the topics listed under each clinical sciences heading.

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 and physiology of the nervous system, including neuroembryology
- Electrophysiologic concepts as they relate to neuronal interactions
- General approach to, and differences in, assessing neonates / infants / children / adolescents
- Mechanisms by which underlying neuroanatomical, neuropathological, and neurophysiological processes result in neurological symptoms and abnormal neurological signs
- Microanatomy and histology of brain, meninges, and peripheral nerves
- Neuroanatomy and neurophysiology of the central nervous system (brain and spinal cord) and its vascular supply
- Neuroanatomy and neurophysiology of muscle, the neuromuscular junction, and the peripheral nervous system, and its vascular supply
- Normal child and adolescent development
- Normal neurodevelopmental changes from premature neonate to adulthood

Neuroimmunology

- Immunology and the processes involved in the generation of immunologically mediated neurological conditions
- Role of the immunologist

Neurogenetics

- Epigenetics
- Genetics and the patterns of inheritance of inherited neurological conditions, including classifications of genetic syndromes
- Knowledge of practical genomics

Neuropsychiatry

- Functional neurological disorders, both acute and chronic, including those presenting as movement disorders, non-epileptic seizures, and weakness
- Neurological basis of psychiatric presentations
- Pharmacological and behavioural treatment of neuropsychiatric illnesses, and potential drug interactions
- Psychological sequelae of chronic neurological illnesses and their management, such as:
  - » anxiety
  - » conversion
  - » depression
  - » psychosis
- Role of the child psychologist and child psychiatrist

Neurorehabilitation

- Formulation of a prognosis based on the natural history of the relevant condition coupled with clinical assessment of the relevant markers for recovery
- Neurorehabilitation, including:
  - » goal setting
  - » indications for referral
  - » setting realistic outcome expectations
  - » the techniques employed
- Place of dorsal rhizotomy
- Recovery from neurological illness and/or injury, including the natural history and neuronal plasticity

- Role of botulinum toxin in the management of spasticity
- Role of the rehabilitationist, including:
  - » continence advisors
  - » occupational therapists
  - » orthopaedic and/or general surgeons in children
  - » physiotherapists
  - » social workers
  - » speech pathologists
- Use of medical devices, such as baclofen pumps and deep brain stimulation

Therapeutic interventions

- Awareness of evolving therapies, particularly immunotherapy and gene therapy
- Classes of medication and dietary interventions used to treat acute and chronic neurological illness, including, but not limited to, those used in epilepsy, migraine management, movement disorders, neurogenetics, neuroimmunology, neuropathic pain, and neuromuscular and neurovascular disease:
  - » common and uncommon adverse effects
  - » indications
  - » monitoring requirements
  - » patient resources
  - » potential drug interactions
  - » safe and rational use
- Devices used in the specialist management of neurological diseases, such as baclofen pumps, deep brain stimulators, and vagal nerve stimulators:
  - » common and uncommon adverse effects
  - » indications
  - » monitoring requirements
  - » neuroanatomy and neuropathology related to implantation
  - » principles of safe and rational use
- Evidence-based pharmacological therapy and other forms of management for various diseases and disorders
- Immunotherapy and cytotoxic drugs
- Management strategies for drug-resistant conditions, such as drug-resistant epilepsy, or those without accepted treatment protocols
- Nerve blocks and their role in pain management
- Neuropharmacology of drug interactions, metabolism, pharmacodynamics, and pharmacokinetics, along with the potential role of pharmacogenomics
- Place of complementary therapeutics
- Reperfusion therapy

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.

Cerebrospinal fluid (CSF)

- Interpret CSF results, including normal ranges, such as:
  - » opening pressure
  - » special tests, such as:
    - o amino acids
    - o CSF cytology
    - o glucose ratio
    - o neurotransmitters
    - o oligoclonal bands
    - o polymerase chain reaction (PCR) for viruses
  - » standard tests, such as:
    - o cell counts
    - o glucose
    - o lactate
    - o protein

Advanced Trainees will know how to explain the investigation or procedure to patients[17], families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	• Limitations of interpretation, and the implications for formulating a diagnosis • Lumbar puncture (LP): » anatomical landmarks and procedure » consent and counselling » contraindications » post-LP care » potential complications and their management, including post-LP headache and blood patch use » requests » urgent investigation • Neuroanatomy and neurophysiology of CSF and its production, including the pathological mechanisms that underlie abnormalities of pressure and CSF constituents • Pre-procedure checklist for contraindications, including fundoscopy **Clinical neurophysiology** • Abnormalities seen on clinical neurophysiology investigations • Appearance of normal waveforms on neurophysiology testing, including the importance of variations with age, specifically evolution from preterm, neonate, and childhood to adulthood • Interpretation of EEG, such as: » correctly localising focal epileptiform discharges and slow wave activity » normal and abnormal EEG waveforms » observing EEG electrode placement and recording » physiological basis of EEG potentials and waveforms » reporting EEG studies, and interpreting findings in clinical context » role and limitations of EEG » technology used for EEG recording » typical EEG patterns for age-dependent childhood epilepsy syndromes, such as: o centrotemporal and perisylvian tangential dipoles o generalised 3Hz spike wave o hypsarrhythmia • Interpretation of electromyography (EMG) and nerve conduction studies (NCS) results, such as: » interpreting EMG and NCS reports » physiological basis of EMG and NCS: o potentials and waveforms o testing and results » technology used for EMG and NCS recording • Interpretation of evoked potential results within the clinical context • Recognising when to: » discuss the results with a neurophysiologist » question a formal report » request further test(s) • The use of high-density EEG and stereoelectroencephalography (SEEG), its risks, and application of results to the clinical scenario **Neurogenetics** • Abnormalities seen on neurogenetic testing in appropriate conditions • Acknowledgement of potential phenotypic variations within and between syndromes, such as 22q11.2 • Awareness of emerging testing • Awareness of the range of genetic testing available • Ethical considerations related to the consent of children

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

- Importance of pre-test counselling and the potential implications of a positive diagnosis for the patient and their family
- Limitations of investigations, such as mol karyotype versus gene panel versus whole exome sequencing (WES) versus whole genome sequencing (WGS), with / without other specialised testing
- Role of the clinical geneticist, and when to arrange a formal referral as opposed to performing a genetic test
- Techniques used in neurogenetics laboratories, including limitations in interpretation of the results, and implications on diagnosis formulation
- Utility of genetic testing in neurological diagnosis, even in asymptomatic individuals

Neuroimaging

- Abnormalities seen on neuroimaging investigations
- Appearance of a normal brain and spinal cord on neuroimaging techniques, including vascular anatomy and pathology
- Considerations of performing neuroimaging, including radiation risks and technical difficulties
- Neuroimaging investigations, such as CT, functional MRI, MRI, nuclear medical scans, and perfusion scans:
  - » limitations to interpretation
  - » place for other MRI techniques:
    - o magnetic resonance:
      - ▪ angiography (MRA)
      - ▪ spectroscopy (MRS)
      - ▪ venogram (MRV)
    - o tractography
  - » risks and complications
  - » sequences used
  - » urgent investigations
  - » uses and indications
- Pathological mechanisms that underlie imaging abnormalities
- Recognising when to:
  - » discuss the results with a neuroradiologist
  - » question a formal report
  - » request further testing

Neuroimmunology

- Abnormalities seen on neuroimmunological testing in appropriate conditions
- Appearances on EEG and MRI of neuroimmunological lesions
- CSF immunological markers
- Limitations of interpretation, and implications for formulating a diagnosis
- Serological immunological markers
- Techniques used in the neuroimmunology laboratory, including limitations to the interpretation of the results

Neurometabolic disorders

- Awareness of those metabolic disorders that may be amenable to bone marrow transplantation or enzyme replacement therapy
- Clinical presentations and potential treatments of treatable neurometabolic disorders, such as Wilson disease and pyridoxine-dependent seizures
- Clinical presentations, investigations, and treatment of common neurodegenerative conditions in childhood, including metabolic, mitochondrial, and neurotransmitter disorders
- CSF lactate and amino acids
- Genetic implications of common neurometabolic conditions, including carrier state phenotype

- Neurologic presentations of common metabolic disorders in childhood and the differential diagnoses for these presentations, such as:
  - developmental regression
  - encephalopathy
  - intellectual deterioration
  - muscle weakness
  - paroxysmal dyskinesia
  - seizures
  - stereotypies
- Plasma and urinary amino acids
- Plasma ammonia, lactate, and pyruvate
- Results of common metabolic investigations, such as plasma amino acids and urine organic acids, and when to review in conjunction with metabolic physicians
- Structured approach to metabolic investigations in childhood, including identifying features such as age at presentation, clinical features, ethnicity, examination findings, and imaging or EEG features, such as distinguishing white matter versus grey matter disorders
- Urine gylcosaminoglycans
- Urine organic acids
- Urine purine and pyrimidine

Neuropathology

- Neuroanatomy of brain, muscle, and nerve, coupled with an understanding of the pathological mechanisms that underlie abnormalities seen on neuropathology
- Neuropathology investigations:
  - abnormalities
  - limitations of interpretation, and the implications for formulating a diagnosis
- Potential complications of neuropathology investigations, and the management of these complications
- Recognition that neuropathology laboratories may have specific requirements for the immediate processing of biopsied tissue, and advise surgeons performing these tests of relevant requirements
- Requesting assistance in performing these investigations from neurosurgeons, ophthalmologists, and/or vascular surgeons

Neuropsychology

- Abnormalities seen on neuropsychological testing
- Limitations of interpretation, and the implications for formulating a diagnosis
- Neuroanatomy and cognitive functions of the brain, and broadly how the various neuropsychological domains are tested by the neuropsychologist
- Roles of the neurologist and neuropsychologist in determining patients' capacity to make decisions

Neurosurgery, including interventional radiology and vascular surgery

- Neuroanatomy, neuropathology, and neurophysiology of acute, chronic, common, and rare diseases
- Procedures:
  - brain tumour surgery, such as:
    - biopsy
    - debulking
    - excision
  - craniectomy and other procedures for the treatment of cranial malformations
  - CSF shunting, CSF diversion procedures, and neuroendoscopy

- emergency surgical procedures for the management of trauma and acute raised elevated intracranial pressure (ICP), such as evacuation of intracranial haematoma
- functional neurosurgery, such as procedures for:
  - deep brain stimulation
  - epilepsy
  - movement disorders
- spinal surgery, such as:
  - laminectomy
  - microdiscectomy
- vascular surgery, such as:
  - aneurysm clipping and coiling
  - endovascular clot retrieval
  - surgical procedures for treatment of moyamoya disease

- Role of the neurosurgeon, radiologist, and vascular surgeon

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis, management and outcomes.

- Awareness of the full neurological examination in neonates and children, and the ways in which to enhance this in examining children of different ages and developmental stages
- Awareness of the International League Against Epilepsy (ILAE) guidelines for the classification and management of childhood epilepsy
- Impact of chronic illness on patients, families, and/or carers:
  - impact and interrelationship of comorbidities and neurological conditions on each other, including:
    - clinical presentation
    - diagnostics
    - impact of illness
    - management
    - prognostics
  - place of complementary treatments
- Patient care considerations for specific patient groups and those with culturally diverse backgrounds, including:
  - Aboriginal and Torres Strait Islander peoples
  - adolescents
  - ethnic minorities
  - low socioeconomic background
  - Māori
  - non-English speaking background
  - overseas travellers
  - pregnant and peripartum states
  - refugees
  - religious ideologies, such as Jehovah's Witness

Neurological emergencies

- Acute, chronic, common, and rare diseases that present as neurological emergencies
- Neuroanatomy, neuropathology, and neurophysiology relevant to the various conditions presenting as neurological emergencies
- Rapid clinical assessment of patients with neurological emergencies:
  - evidence-based pharmacological therapy and other treatments used in acute neurological presentations, and their potential complications
  - prognosis and implications of these disorders
- Role of the intensive care unit, neurosurgeon, and palliative care physician

End-of-life (EOL) considerations

- EOL issues and consultation with patients and/or caregivers to determine management plans that prevent suffering
- Manage symptoms, such as:
  - anxiety
  - dyspnoea
  - hydration
  - nutrition
  - pain
- Techniques used by palliative care physicians, along with the potential complications of any procedures involved

Learning goal 16 – Congenital malformation disorders

Advanced Training in Neurology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations – antenatal malformation disorders

- Abnormal antenatal neuroimaging (fetal MRI and ultrasound)

Presentations – postnatal

- Bladder / Bowel problems
- Developmental delay
- Difficulty with movement and balance
- Dwarfism or short stature
- Headache
- Irregular head shape
- Macrocephaly
- Memory problems
- Metabolic disturbance
- Microcephaly
- Muscle weakness, such as difficulty walking, stiffness, and/or paralysis
- Nausea and/or vomiting
- Problems with eating, feeding, and swallowing
- Rapid head growth and/or bulging veins
- Seizures
- Vision and hearing problems

Conditions – antenatal

- Callosal abnormalities
- Cerebellar hypoplasia
- Congenital infections
- Neuronal migrational disorders
- Posterior fossa malformations, including:
  - » cisterna magna
  - » Dandy–Walker syndrome
- Septo-optic dysplasia spectrum
- Ventriculomegaly

Conditions – postnatal

- Acquired malformations, such as:
  - » congenital infection
  - » encephalomalacia
  - » hypoxic ischaemic encephalopathy
- Congenital malformations, such as:
  - » antenatal conditions (with postnatal presentation)
  - » focal cortical dysplasias
  - » tubulinopathies

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[18] 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

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

	• Craniosynostosis, plagiocephaly, and syndromic craniosynostosis • Destructive malformations, such as: » anencephaly » holoprosencephaly » schizencephaly • Dysmorphic syndromes • Genetic syndromes, including: » neurofibromatosis » overgrowth syndromes • Hydrocephalus • Inborn errors of metabolism • Spina bifida and other malformations of spinal cord development	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	**Malformations** • Causes of an irregularly sized or shaped head • Causes of raised intracranial pressure • Clinical features and presentations of the common forms of brain malformation • Embryology of brain and spinal cord development • Impact of maternal disorders and prenatal neurologic diagnoses on the fetus • Investigation and management planning for developmental malformations and/or dysmorphic syndromes identified in the newborn period • Mechanisms of cerebrospinal fluid (CSF) formation and flow pathway • Patterns of brain malformation • Presentations and complications of spinal cord malformations	
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.	**CSF procedures and investigations** • Lumbar puncture (LP) and interpretations results of investigations, such as: » basic CSF analysis: o cell count o cytology o microbiological tests o protein level o glucose level o xanthochromia **Clinical neurophysiology investigations** • EEG: » amplitude-integrated EEG » standard EEG » video EEG **Neurogenetic investigations** • Genetic testing, including, but not limited to: » chromosomal testing, such as: o karyotype o microarray » genomic testing, including whole exome or genome sequencing » mitochondrial genome sequencing » targeted panel testing • Referral to a neurogeneticist	

Neuroimaging investigations

- Antenatal ultrasound
- Fetal MRI
- Magnetic resonance:
  - » angiography (MRA)
  - » spectroscopy (MRS)
  - » venogram (MRV)
- MRI

Neuropsychological investigations

- Behavioural, cognitive, and developmental screening:
  - » Bayley Scales of Infant and Toddler Development
  - » Conners neuropsychology assessment tools
  - » Wechsler Intelligence Scale for Children (WISC-V)
  - » Wechsler Preschool and Primary Scale of Intelligence (WPPSI)
- Referral to a neuropsychologist

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.

- Approach to antenatal counselling and the role of the multidisciplinary team
- Interpretation of antenatal imaging

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Abnormal movements
- Agitation, confusion, or lethargy
- Cardiac issues
- Gross motor delay
- Gross motor or language regression
- Headaches
- Hearing loss
- Hepatosplenomegaly
- Hypersomnia
- Hypertonia
- Hypotonia
- Impaired balance / coordination
- Loss of cognitive skills
- Memory loss
- Microcephaly
- Myotonia
- Neurocutaneous syndromes
- New onset aspiration or choking, and swallowing difficulties
- Seizures
- Spasms
- Status epilepticus and dystonicus
- Vision problems, including:
  - » double vision
  - » ptosis
  - » visual loss

Conditions – epilepsy

- Childhood seizures
- Encephalopathy:
  - » developmental
  - » epileptic
- Infantile epileptic spasms syndrome (IESS)
- Status epilepticus

Conditions – genetic / syndromic

- Aicardi–Goutières syndrome
- Chromosomal abnormalities
- Neurocutaneous syndromes
- Neuromuscular conditions
- Specific genetic conditions

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[19] 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

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

Conditions – infection

- Intrauterine infections
- Postnatal infections, such as:
  - » encephalitis
  - » meningitis

Conditions – inflammatory

- Autoimmune encephalopathies, including:
  - » acute disseminated encephalomyelitis (ADEM)
  - » anti-NMDA receptor (NMDAr) encephalitis
- Multiple sclerosis (MS)

Conditions – metabolic

- Acute encephalopathy secondary to metabolic crisis
- Amino acid and organic acidurias
- Glycogen storage disorders
- Glycosylation disorders
- Lipofuscinoses
- Mitochondrial disorders
- Porphyria
- Storage disorders
- Urea cycle defects
- Wilson disease

Conditions – other

- Autism spectrum disorder
- Inflicted injury
- Nutritional, such as:
  - » vitamin B12 deficiency
- Obstructive sleep apnoea
- Oncological central nervous system (CNS) conditions
- Persuasive development disorders
- Toxins or therapy related-chemoradiation

Conditions – structural

- Acquired perinatal or postnatal infective, traumatic, or vascular insult
- Cerebral malformations or neuronal migration defects
- Hydrocephalus:
  - » acquired
  - » congenital
- Intracranial or spinal vascular malformations
- Space-occupying lesion

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** • Abnormal newborn screen **Conditions** • Acute onset neuropsychiatric syndrome (PANS) • Neuropsychiatric childhood onset autoimmune conditions, such as: » systemic lupus erythematosus (SLE) • Psychiatric conditions, such as: » acute psychosis
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Assessment of all relevant maternal and child history, as well as family history, pertaining to all aspects of development of an infant, child, or young person • Causes of developmental delay and the area affected, such as global or specific • Determining whether other organs are involved, from history and examination • Determining whether the clinical features are referable only to the CNS, or if the peripheral nervous system is involved • Disorders causing developmental regression in terms of anatomical location, such as grey matter and white matter • Longitudinal aspects of / assessment intervals for infants, children, and young people with developmental delay / disabilities • Neurodevelopmental features and examination findings of normal preterm and term infants • Normal development ranges for: » fine motor » gross motor » social » speech and language • Presentation of neurodegenerative disorders at different ages • Range of developmental assessment tools for infants, children, and young people with developmental delay / disabilities • Recognise infants, children, and young people with neurological deficits • Treatable causes of developmental regression, such as: » coeliac disease » creatine deficiency » vitamin B12 deficiency » Wilson disease
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	**Cerebrospinal fluid (CSF) procedures and investigations** • Lumbar puncture (LP) and interpretations results of investigations, such as: » basic CSF analysis: o cell count o cytology o immunological tests o microbiological tests o paired serum and: ▪ CSF glucose level ▪ CSF lactate o protein level o xanthochromia

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.

- » opening pressure
- » special tests:
  - o anti-NMDA antibody
  - o CSF amino acids
  - o neurotransmitters, including:
    - ▪ neopterin
  - o paired oligoclonal bands

Clinical neurophysiology investigations

- EEG:
  - » sleep-deprived EEG
  - » standard EEG
  - » video EEG
- Electromyography (EMG):
  - » needle EMG
  - » single-fibre EMG
- Evoked potentials:
  - » brainstem
  - » somatosensory
  - » visual
- Nerve conduction studies (NCS):
  - » motor and sensory studies
  - » repetitive nerve stimulation

Neurogenetic investigations

- Genetic testing, including, but not limited to:
  - » chromosomal testing, such as:
    - o karyotype
    - o microarray
  - » genomic testing, including whole exome or genome sequencing
  - » mitochondrial genome sequencing
  - » targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - » CT angiography
  - » perfusion
- Functional imaging:
  - » functional MRI (fMRI)
  - » PET
  - » single photon emission computed tomography (SPECT)
- Magnetic resonance:
  - » angiography (MRA)
  - » spectroscopy (MRS)
  - » venogram (MRV)
- MRI
- Vascular imaging:
  - » catheter angiography
  - » Doppler ultrasound

Neuroimmunology investigations

- Autoantibody measurement:
  - » antinuclear antibodies and anti DsDNA autoantibodies
  - » anti-acetylcholine receptor antibodies
  - » anti-aquaporin 4 antibodies
  - » limbic encephalitis panel

Neuropathology investigations

- Biopsy:
  - » brain / meningeal
  - » muscle
  - » nerve

Neuropsychological investigations

- Bayley Scales of Infant and Toddler Development
- Behavioural, cognitive, and developmental screening
- Conners neuropsychology assessment tools
- Neuropsychology assessment
- Referral to a neuropsychologist
- Wechsler Intelligence Scale for Children (WISC-V)
- Wechsler Preschool and Primary Scale of Intelligence (WPPSI)

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - ECG
  - echocardiography
- Other laboratory tests:
  - 24-hour urinary copper
  - ammonia
  - blood gas
  - creatine kinase
  - liver function tests
  - serum ceruloplasmin
  - thrombophilia screen
  - thyroid function tests
  - transferrin isoforms
  - urinary porphyrins
  - vitamin B12 level
  - white cell enzymes
- Polysomnography

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.

- History and findings of an infant, child, or young person, and communication of this information to other professionals
- Role of allied health in assessment of infants, children, and young people with developmental delay / disabilities

Learning goal 18 – Pain, including headaches, facial pain, and sensory loss

Advanced Training in Neurology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Acute sensory loss
- Back pain
- Bulging fontanelle
- Dizziness
- Fatigue
- Headache – disturbed vision, nausea and/or vomiting
- Muscular difficulties, such as:
  - coordination problems
  - paralysis
  - stiffness
  - weakness
- Neuropathic pain
- Pain in head and/or face
- Pins and needles and/or sensory loss
- Reduced level of consciousness
- Sciatica
- Sensory or auditory aura
- Sensory sensitivity
- Speech and/or swallowing difficulties
- Vertigo
- Visual disturbance

Conditions – brain and spine

- Intracranial haemorrhage, such as:
  - subarachnoid haemorrhage
- Meningitis and other central nervous system (CNS) infections
- Multiple sclerosis (MS) of brain or spinal cord
- Neuromyelitis optica
- Raised intracranial pressure, including from space-occupying lesions
- Spinal cord compression or ischaemia
- Traumatic brain injury, including:
  - concussion
- Vascular conditions, including:
  - arteriopathy
  - ruptured malformation
  - stroke
- Vasculitis

Conditions – other

- Functional neurological disorders

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[20] 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

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

	Conditions – peripheral nerve disorders • Botulism • Entrapment neuropathies • Guillain–Barré syndrome • Other acquired and inherited peripheral neuropathies • Plexopathies • Radiculopathies **Conditions – primary headaches** • Migraine-like headaches • Migraine with brainstem features • Migraine with or without aura • New persistent daily headaches • Status migrainosis • Tension type headaches **Conditions – secondary headaches** • Idiopathic intracranial hypertension • Low pressure headaches • Medication-overuse headache	
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** • Cervicogenic headaches • Cluster headaches and other trigeminal autonomic cephalalgias • Glossopharyngeal neuralgia • Headaches attributed to intracranial arterial disorder, such as: » reversible cerebral vasoconstriction syndrome (RVCS) • Myofascial pain syndrome • Temporomandibular joint disorders • Trigeminal neuralgia	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Current headache classification, such as International Classification of Headache Disorders (ICHD) • Headache syndromes • Identification of secondary headache from underlying causes • Migraine, migraine equivalents, and migraine variants • Neuroanatomy, neuropharmacology, and neurophysiology involved in the generation of headache and facial pain • Neuroanatomy, neuropharmacology, and neurophysiology of the pain pathway, peripheral nerves, and sensory pathways • Rational use of investigations for headache • Recognition of tumours presenting without headache	

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.

Cerebrospinal fluid (CSF) procedures and investigations

- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - basic CSF analysis:
    - cell count
    - cytology
    - glucose level
    - immunological tests
    - microbiological tests
    - protein level
    - xanthochromia
  - fundoscopy
  - opening pressure
  - special tests:
    - anti-myelin oligodendrocyte glycoprotein (MOG) antibodies
    - oligoclonal bands

Clinical neurophysiology investigations

- Electromyography (EMG):
  - needle EMG
  - single-fibre EMG
- Nerve conduction studies (NCS):
  - motor and sensory studies
  - repetitive nerve stimulation
- Vestibular function tests

Neurogenetic investigations

- Genetic testing, including, but not limited to:
  - chromosomal testing, such as:
    - karyotype
    - microarray
  - genomic testing, including whole exome or genome sequencing
  - mitochondrial genome sequencing
  - targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - CT angiography
  - perfusion
- MRI (and other specialised magnetic resonance techniques)
- Vascular imaging:
  - catheter angiography
  - Doppler ultrasound

Neuroimmunology investigations

- Autoantibody measurement:
  - anti-aquaporin 4 antibodies
  - anti-MOG antibodies
  - paraneoplastic antibodies
- Referral to a neuroimmunologist

Neuropathology investigations

- Nerve biopsy

IMPORTANT SPECIFIC ISSUES

Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis

- Importance of early diagnosis and treatment of acute conditions
- Knowledge and treatment strategies for psychosocial effects and drivers of pain
- Management strategies for the common types of headache:
  - non-pharmaceutical interventions, such as:
    - biofeedback
    - psychological and relaxation therapies, such as:
      - massage

and management and integrate these into care.	o sleep hygiene o yoga » rational use of medications » use of botulinum toxin and nerve blocks in the management of migraines • Overlap with other allied health and medical specialties, such as pain services, physiotherapy, and rehabilitation medicine, and when it is appropriate to refer patients • Overlap with other medical conditions, such as depression • Prognosis and implications of these disorders

KEY PRESENTATIONS AND CONDITIONS

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

Presentations – disorders of consciousness

- Akinetic mutis
- Bulging fontanelle
- Coma
- Confusion
- Delirium
- Delusions
- Depersonalisation / Derealisation
- Disturbed vision, including diplopia or visual loss
- Dizziness
- Hallucinations
- Headache
- Illusions
- Lethargy
- Locked-in syndrome
- Minimally conscious state
- Obtundation / Stupor
- Seizures
- Syncope
- Vegetative state (VS) / Unresponsive wakefulness syndrome (UWS)
- Vomiting

Presentations – sleep

- Acute sleepiness
- Apnoea or loud snoring
- Concentration / Memory difficulties
- Confusion when waking
- Difficulty sleeping
- Enuresis (bed-wetting)
- Episodes of incomplete awakening and limited responsiveness
- Excessive daytime somnolence
- Hypersomnia
- Morning headaches
- Night terrors
- Periodic limb movements
- Sleep paralysis
- Sleepwalking
- Sudden attacks of sleep

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[21] 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

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

Conditions – infectious, inflammatory, and toxic

- Acute disseminated encephalomyelitis (ADEM)
- Acute leucoencephalopathy with restricted diffusion / Acute encephalopathy with biphasic seizures and restricted diffusion
- Autoimmune
- Demyelinating
- Drug withdrawal
- Electrolyte disturbance
- Encephalitis
- Endocrinopathies
- Hepatic
- Hypernatremia
- Hypoglycaemia
- Hyponatremia
- Meningitis
- Metabolic
- Prescribed and illicit drugs
- Renal
- Shock
- Systemic conditions
- Toxic drugs:
  - » illicit
  - » prescribed
- Vasculitis

Conditions – other

- Arterial dissection
- Breath-holding
- Cardiac
- Cerebrovascular
- Continuous spikes and waves during sleep (CSWS)
- Endocrine:
  - » diabetic ketoacidosis
  - » thyroid issues
- Epilepsy
- Epileptic encephalopathy
- Hydrocephalus
- Hypoxia
- Hypoxic ischaemic encephalopathy
- Migraine and migraine equivalents
- Neurocardiogenic
- Non-convulsive status
- Pontine stroke
- Postictal state
- Seizures
- Smoke inhalation
- Syncope
- Trauma, including:
  - » concussion
  - » inflicted injury
- Traumatic brain injury
- Vertibrobasilar insufficiency

Conditions – psychiatric

- Anxiety
- Factitious illness
- Functional neurological disorder
- Paediatric acute-onset neuropsychiatric syndrome
- Panic attacks

Conditions – sleep

- Apnoea of prematurity
- Cataplexy
- Chiari malformation
- Down syndrome
- Hypersomnia
- Insomnia
- Narcolepsy
- Obstructive sleep apnoea:
  - » adenotonsillar hypertrophy
  - » airway abnormalities
  - » craniofacial abnormalities
  - » neuromuscular conditions
  - » obesity
- Parasomnia:
  - » confusional arousals
  - » non-rapid eye movement (REM) night terror
  - » periodic limb movement disorder
  - » REM sleep behaviour disorder
  - » sleep paralysis
  - » sleepwalking
- Prader–Willi syndrome
- Restless leg syndrome
- Sleep-disordered breathing

Conditions – structural

- Abscess
- Haemorrhage
- Hydrocephalus
- Raised intercranial pressure
- Space-occupying lesions
- Stroke
- Tumour

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

- Congenital central hypoventilation syndrome
- Iatrogenic illness
- Kleine–Levin syndrome

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

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

- Acute, chronic, common, and rare diseases that result in decreased consciousness and disorders of sleep
- Conditions required for brain death diagnosis
- Neuroanatomy, neuropharmacology, and neurophysiology of:
  - brain and brainstem mechanisms involved in the maintenance of normal consciousness
  - normal sleep function
- Pathological mechanisms that result in:
  - decreased consciousness
  - disturbed sleep, and describe the way disorders of sleep can present

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.

Assessments

- Epworth Sleepiness Scale for Children and Adolescents
- Glasgow Coma Scale
- Neurobehavioural assessment tools in children with disorders of consciousness, such as:
  - Cognitive and Linguistic Scale (CALS)
  - Coma Recovery Scale for Pediatrics (CRS-P)
- Pittsburgh Sleep Quality Index (PSQI)
- Sleep Disturbance Scale for Children (SDSC)

Cerebrospinal fluid (CSF) procedures and investigations

- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - basic CSF analysis:
    - cell count
    - cytology
    - immunological tests
    - microbiological tests
    - neurotransmitters
    - protein level
    - glucose level
    - xanthochromia
  - opening pressure
  - special tests:
    - oligoclonal bands

Clinical neurophysiology investigations

- EEG:
  - sleep-deprived EEG
  - standard EEG
  - video EEG
- Evoked potentials:
  - brainstem
  - somatosensory
  - visual

Neurogenetic investigations

- Genetic testing, including, but not limited to:
  - chromosomal testing, such as:
    - karyotype
    - microarray
  - genomic testing, including whole exome or genome sequencing
  - mitochondrial genome sequencing
  - targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - CT angiography
  - perfusion

- Functional imaging:
  - functional MRI (fMRI)
  - PET
  - single photon emission computed tomography (SPECT)
- Magnetic resonance:
  - angiography (MRA)
  - spectroscopy (MRS)
  - venogram (MRV)
- MRI
- Vascular imaging:
  - catheter angiography
  - Doppler ultrasound

Neuroimmunology investigations

- Autoantibody measurement:
  - anti-acetylcholine receptor antibodies
  - anti-aquaporin 4 antibodies
  - limbic encephalitis autoantibody testing
  - myelin oligodendrocyte glycoprotein (MOG) antibody
  - other autoimmune conditions with neuropsychiatric manifestations, such as:
    - systemic lupus erythematosus (SLE)
- Referral to a neuroimmunologist

Neuropathology investigations

- Brain biopsy

Neuropsychological investigations

- Cognitive screening:
  - Mini-Mental State Examination
- Referral to a neuropsychologist

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - ECG
  - echocardiography
- Other laboratory tests:
  - ammonia
  - blood gas
  - blood glucose
  - coagulation profile
  - cortisol
  - infection screen
  - lactate
  - plasma amino acids
  - pyruvate metabolic
  - serum electrolytes
  - sugar
  - thiamine
  - urine drug screen
  - urine metabolic profile
- Polysomnography

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.

- Conditions that mimic disturbance of consciousness, such as:
  - acute dysphasic
  - functional disorders, including:
    - non-epileptic status epilepticus
  - locked-in syndrome
  - stroke
- Conditions that result in prolonged disturbance of consciousness, such as:
  - minimally conscious state
  - persistent vegetative state
- Diagnosis and management approaches for patients with altered states of consciousness
- Differentiation of sleep disorders from related neurological presentations, such as frontal lobe epilepsy and parasomnias, and night terrors
- Prioritise aspects of management for patients with altered states of consciousness
- Prognosis and implications of sleep disorders, such as driving
- Working with multidisciplinary teams, particularly intensive care

Learning goal 20 – Paroxysmal disorders, including seizures, syncope, and stroke

Advanced Training in Neurology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Breath-holding – cyanotic / pallid
- Confusion / Fugue
- Fainting / Loss of consciousness
- Fatigue
- Impaired awareness or staring, with or without motor accompaniment
- Jerky, rhythmic, or twitching motions
- Light-headedness and/or dizziness
- Muscular difficulties, such as coordination problems, stiffness, weakness, and/or paralysis
- Nausea and/or vomiting
- Poor feeding
- Seizures
- Sensory disturbances
- Speech difficulties
- Sweating

Conditions – epileptic

- Childhood epilepsy syndromes
- Developmental and epileptic encephalopathy
- First seizure
- Focal epilepsy
- Generalised epilepsy
- Immunological
- Inborn errors of metabolism associated with epilepsy
- Infantile epileptic spasms syndrome
- Inflammatory epilepsies
- Metabolic disturbance
- Provoked seizures
- Status epilepticus

Conditions – haemorrhagic

- Primary intracranial haemorrhage
- Subarachnoid haemorrhage
- Venous infarction

Conditions – ischaemic

- Amaurosis fugax
- Ischaemic stroke:
  - » acute thromboembolic
  - » arterial
- Non-atherosclerotic arteriopathies, such as moyamoya disease
- Transient ischaemic attacks

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[22] 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

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

	• Vasculitides • Venous sinus thrombosis • Watershed infarcts **Conditions – non-epileptic** • Alternating hemiplegia • Benign neonatal sleep myoclonus • Benign paroxysmal torticollis • Breath-holding • Episodic ataxias • Febrile seizures • Hyperekplexia • Migraine with brainstem features • Non-epileptic seizures, including: » non-epileptic status parasomnias • Paroxysmal dyskinesia • Recurrent vertigo of childhood / Benign paroxysmal vertigo of childhood • Shuddering spells • Stereotypies • Tics • Tonic upgaze of infancy **Conditions – stroke mimics** • Functional neurological disorder • Migraine • Mitochondrial disorders • Todd's paresis **Conditions – syncope** • Cardiac arrhythmias • Dehydration • Reflex anoxic • Vasovagal syncope	
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 – dizziness / vertigo** • Benign paroxysmal positional vertigo (BPPV) **Conditions** • Autonomic failure • Carotid sinus hypersensitivity • New-onset refractory status epilepticus (NORSE)	

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

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

- Age-related presentations in epileptic symptoms
- Arterial blood supply, vascular anatomy, and venous drainage of the brain and spinal cord
- Causes of stroke in children, such as non-atherosclerotic arteriopathies and congenital heart disease, and the potential genetic variants associated with these
- Causes of stroke syndromes:
  - haemorrhagic
  - ischaemic
  - mimics
- Classification and clinical features of the different types of epileptic seizures, as from International League Against Epilepsy (ILAE)
- Classification of epilepsy and childhood epileptic syndromes
- Common, primary, rare, and secondary diseases that result in seizures and syncope
- Evidence-based pharmacological therapy and other forms of management of stroke and related syndromes, in relation to acute presentation, prophylaxis, and rehabilitation
- Neuroanatomy, neurophysiology, and related imaging of paediatric stroke
- Neuroanatomy, neuropharmacology, and neurophysiology involved in the generation of epilepsy and syncope
- Neuropharmacology and surgical interventions for paediatric stroke, based on national clinical guidelines
- Paroxysmal non-epileptic attacks presenting at different ages, and their key features

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.

Cerebrospinal fluid (CSF) procedures and investigations

- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - basic CSF analysis:
    - cell count
    - cytology
    - glucose level, including:
      - paired serum ratio
    - immunological tests
    - microbiological tests
    - protein level
    - xanthochromia
  - opening pressure
  - special tests:
    - amino acids
    - CSF lactate
    - oligoclonal bands

Clinical neurophysiology investigations

- EEG:
  - prolonged video EEG
  - sleep-deprived EEG
  - standard EEG
  - stereotactic EEG (SEEG)
- Vestibular function tests

Neurogenetic investigations

- Genetic testing, including but not limited to:
  - chromosomal testing, such as:
    - karyotype
    - microarray
  - genomic testing, including whole exome or genome sequencing
  - mitochondrial genome sequencing
  - targeted panel testing

- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - CT angiography
  - perfusion
- Functional imaging:
  - functional MRI (fMRI)
  - PET
  - single photon emission computed tomography (SPECT)
- Magnetic resonance:
  - angiography (MRA)
  - spectroscopy (MRS)
  - venogram (MRV)
- MRI
- Vascular imaging:
  - catheter angiography
  - Doppler ultrasound

Neuropathology investigations

- Brain biopsy

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - bubble study
  - ECG
  - echocardiography
- Other laboratory tests:
  - leukocyte enzymes
  - plasma amino acids
  - plasma lactate
  - plasma pyruvate
  - thrombophilia screen
  - urinary metabolic screen
  - urinary porphyrins
  - vasculitis screen
- Polysomnography

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.

- Appropriate potential candidates for epilepsy diet service
- Appropriate potential candidates for evaluation for epilepsy surgery, including implantable devices
- Awareness of appropriate and timely neurogenetic testing, what is available to the neurologist, and what requires genetic referral / consultation
- Awareness of national clinical stroke guidelines, and application of this within each network employed
- Maintain up-to-date knowledge of childhood epilepsy syndromes, particularly those identified by the ILAE position papers
- Management of diagnostic uncertainty and counselling in relation to risk management
- Management strategies, such as:
  - antiseizure medicine
  - diet
  - epilepsy surgery
  - vagal nerve stimulator
- Overlap with other allied health and medical specialties, such as:
  - dietetics
  - general paediatricians
  - occupational therapy
  - physiotherapy
  - rehabilitation medicine

    - speech pathology
- Overlap with other medical conditions, such as:
    - cardiac disorders
    - functional neurological presentations
    - non-epileptic disorders
    - sleep disorders
    - syncope
- Prognosis, implications, and management strategies for dealing with epilepsy
- Prognosis, implications, and management strategies for stroke, such as:
    - acute management
    - impact on the family
    - rehabilitation
    - secondary prevention

KEY PRESENTATIONS AND CONDITIONS

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

Presentations – hearing

- Dysphagia
- Ear:
  - » malformation
  - » pain
- Fever
- Headache
- Hearing loss
- Hyperacusis
- Loss of balance
- Nausea
- Rash
- Tinnitus
- Vertigo
- Vomiting

Presentations – smell and taste

- Change or loss in taste
- Drooling
- Headache
- Loss of smell
- Parosmia
- Seizure

Presentations – vision

- Decreased visual acuity
- Double vision
- Drooping of eyelids
- Dysmorphism
- Falls
- Fever
- Hallucinations
- Headache / Periorbital pain
- Microcephaly
- Microphthalmia
- Migraine
- Motor delay
- Night blindness
- Nystagmus
- Opsoclonus
- Pain on eye movement
- Papilloedema
- Photophobia
- Poor depth perception
- Poor fixation
- Seizures
- Speech delay
- Vertigo
- Visual hallucinations / auras

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[23] 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

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

- Visual loss

Conditions – hearing

- Acoustic neuroma and other brainstem tumours
- Congenital deafness
- Medication-related
- Post-infection / Post-meningitis

Conditions – smell / taste

- Bell's palsy
- Neurodegenerative conditions
- Orbitofrontal tumours

Conditions – vision

- Achromatopsia
- Acute demyelinating encephalomyelitis
- Cataracts
- Cerebral / Cortical visual impairment
- Epilepsy
- Functional neurological disorder
- Idiopathic intracranial hypertension (pseudotumor cerebri)
- Infections
- Leber congenital amaurosis
- Leber hereditary optic neuropathy
- Medication-related
- Migraine
- Myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD)
- Multiple sclerosis (MS)
- Neuromuscular conditions
- Neuromyelitis optica
- Ocular motor nerve palsies
- Oncological conditions, such as:
  - optic pathway gliomas
- Optic nerve hypoplasia
- Optic neuritis
- Raised intracranial pressure secondary to intracranial space-occupying lesion or cerebral venous thrombosis
- Retinal dystrophies
- Retinopathy of prematurity
- Septo-optic dysplasia
- Stargardt disease
- Trauma affecting vision
- Vascular event resulting in sudden vision loss

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

- Congenital myasthenic syndromes
- Other iatrogenic / hypertensive / toxic / traumatic occurances

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

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

- Causes of visual disturbance and eye movement abnormalities
- Methods of assessing automated and confrontation perimetry, pupillary function, visual acuity, and visual fields, including non-organic presentations
- Neuroanatomy and neurophysiology of the auditory, oculomotor, olfactory, pupillary, vestibular, and visual systems
- Neurodevelopmental features and examination findings of normal preterm and term infants

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.

Cerebrospinal fluid (CSF) procedures and investigations

- Fundoscopy – normal versus abnormal
- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - basic CSF analysis:
    - cell count
    - cytology
    - immunological tests
    - lactate
    - microbiological tests
    - protein level
    - glucose level
    - xanthochromia
  - opening pressure
  - special tests:
    - amino acids
    - neurotransmitters
    - oligoclonal bands

Clinical neurophysiology investigations

- EEG:
  - sleep-deprived EEG
  - standard EEG
  - video EEG
- Electromyography (EMG):
  - needle EMG
  - single-fibre EMG
- Electroretinogram

- Evoked potentials:
  - » brainstem
  - » visual
- Nerve conduction studies
- Repetitive nerve stimulation

Neurogenetic investigations

- Genetic testing, including but not limited to:
  - » chromosomal testing, such as:
    - o karyotype
    - o microarray
  - » genomic testing, including whole exome or genome sequencing
  - » mitochondrial genome sequencing
  - » targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - » CT angiography
- Functional imaging:
  - » functional MRI (fMRI)
  - » PET
  - » single photon emission computed tomography (SPECT)
- Magnetic resonance:
  - » angiography (MRA)
  - » spectroscopy (MRS)
  - » venogram (MRV)
- MRI

Neuroimmunology investigations

- Autoantibody measurement:
  - » anti-acetylcholine receptor antibodies
  - » anti-aquaporin 4 antibodies
  - » anti-myelin oligodendrocyte glycoprotein (MOG) antibodies
  - » paraneoplastic antibodies

Neuropathology investigations

- Biopsy:
  - » brain
  - » muscle

Neuropsychological investigations

- Autoimmune work up
- Mini-Mental State Examination
- Referral to a neuropsychologist
- Routine bloods including inflammatory markers

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.

- Overlap with other medical specialties, such as ophthalmology and otolaryngology / ear, nose, and throat (ENT) specialties
- Prognosis and implications of these disorders

Learning goal 22 – Weakness and disorders of speech, language, and swallowing

Advanced Training in Neurology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Breathing difficulties / Shortness of breath
- Cardiac arrhythmia
- Confusion
- Decreased urine and dark red / brown colour
- Difficulty speaking, swallowing, and/or chewing
- Disordered movement of facial muscles, including:
  - drooping
- Fatigue
- Headaches
- Muscle cramps, spasms, and/or twitches
- Muscular difficulties, such as aching, coordination problems, difficulty walking, stiffness, swelling, weakness, and/or paralysis
- Numbness
- Pain
- Purple-red skin rash
- Sciatica
- Sensory sensitivity
- Slurred speech
- Vision problems, including:
  - pain
  - vision loss
- Weakness

Conditions – brain and brain stem

- Acute disseminated encephalomyelitis (ADEM)
- Bickerstaff encephalitis
- Brain malformation disorders
- Degenerative disease, such as:
  - mucopolysaccharidoses (MPS)
- Degenerative genetic disease
- Multiple sclerosis (MS)
- Myelin oligodendrocyte glycoprotein (MOG) disorders and myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD)
- Neuromyelitis optica spectrum disorders (NMO)
- Static encephalopathy
- Stroke

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[24] 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

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

- White matter disorders, such as:
  - leukodystrophy

Conditions – muscle

- Becker muscular dystrophy
- Dermatomyositis
- Duchenne muscular dystrophy
- Inflammatory myopathy
- Inherited muscle disease, including:
  - congenital myopathies
  - metabolic myopathies
- Myotonic dystrophy
- Other muscular dystrophy, such as:
  - facioscapulohumeral
  - limb girdle
- Polymyositis
- Rhabdomyolysis

Conditions – neuromuscular junction

- Botulism
- Lambert–Eaton myasthenic syndrome
- Myasthenia gravis

Conditions – peripheral nerves

- Bell's palsy
- Entrapment neuropathies
- Guillain–Barré syndrome
- Miller Fischer syndrome
- Other acquired and inherited peripheral neuropathies
- Plexopathies
- Radiculopathies

Conditions – psychological

- Functional neurological disorder

Conditions – spinal cord

- Demyelination
- MS
- Neuromyelitis optica
- Spinal cord compression
- Spinal muscular atrophy

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

- Dystrophia myotonica
- Poliomyelitis

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

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

- Acute, chronic, common, and rare diseases that cause weakness, as well as disorders of:
  - dysarthria
  - dysphagia
  - dysphasia
  - language
  - speech
  - swallowing
- Neuroanatomy and neurophysiology of the pathways involved with speech and swallowing
- Neuroanatomy, neuropharmacology, and neurophysiology of the:
  - motor pathways
  - neuromuscular junction
  - peripheral nerves
  - somatic musculature

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.

Cerebrospinal fluid (CSF) procedures and investigations

- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - basic CSF analysis:
    - cell count
    - cytology
    - glucose level
    - immunological tests
    - microbiological tests
    - protein level
  - special tests:
    - NMDAr antibodies and autoimmune encephalopathy panel
    - oligoclonal bands

Clinical neurophysiology investigations

- Electromyography (EMG):
  - needle EMG
  - single-fibre EMG
- Evoked potentials:
  - brainstem
  - somatosensory
  - visual
- Nerve conduction studies (NCS):
  - motor and sensory studies
  - repetitive nerve stimulation

Neurogenetic investigations

- Genetic testing, including but not limited to:
  - chromosomal testing, such as:
    - karyotype
    - microarray
  - genomic testing, including whole exome or genome sequencing
  - mitochondrial genome sequencing
  - targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- Magnetic resonance:
  - angiography (MRA)
  - spectroscopy (MRS)
  - venogram (MRV)
- MRI
- Myelography

Neuroimmunology investigations

- Autoantibody measurement:
  - anti-acetylcholine receptor antibodies
  - anti-aquaporin 4 antibodies
  - anti-MOG antibodies
  - paraneoplastic antibodies
- Referral to a neuroimmunologist

Neuropathology investigations

- Biopsy:
  - muscle
  - nerve

Neuropsychological investigations

- Cognitive screening
- Referral to a neuropsychologist

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - ECG
  - echocardiography
- Lung function tests:
  - formal lung function tests
  - vital capacity
- Other laboratory tests:
  - B12 level
  - creatine kinase
  - fasting glucose and HbA1c
  - thyroid function testing
  - videofluoroscopy and swallow assessments

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.

- Overlap with other allied health and medical specialties, such as:
  - immunology
  - medical genetics
  - physiotherapy
  - rehabilitation medicine
  - speech pathology
- Prognosis and implications of these disorders

Learning goal 23 – Disorders of gait and balance, including vertigo, dizziness, and disequilibrium

Advanced Training in Neurology (Paediatrics & Child Health)

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Ataxia
- Back / Limb pain, acute
- Breathlessness
- Difficulties with speech and/or swallowing
- Double vision
- Dizziness
- Falls
- Fatigue
- Fever
- Headache
- Hearing loss
- Lethargy
- Limp, acute
- Loss of bladder / bowel control and/or urinary urgency
- Lower limb(s) weakness, acute
- Migraine
- Motor regression
- Non-weight bearing child, acute
- Nystagmus
- Palpitations
- Paroxysmal torticollis
- Poor feeding
- Syncope
- Tinnitus
- Toe walking
- Tremor
- Vertigo
- Vomiting
- Weakness

Conditions – central nervous system (CNS)

- Acute disseminated encephalomyelitis (ADEM) and other inflammatory encephalitis
- Brainstem encephalitis
- Cerebellar ataxia, acute
- Cerebellitis, acute
- Cerebral or brainstem / posterior circulation vascular event
- Cerebral palsy (CP)
- Channelopathies causing periodic paralysis
- Chiari malformation

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[25] 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

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

- Drugs and toxins
- Epilepsy:
  - atonic
  - autonomic seizures
  - drop attack
- Episodic ataxia
- Gait apraxia
- Glucose transporter defects
- Hydrocephalus
- Multiple sclerosis (MS)
- Myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD)
- Neurodegenerative conditions
- Normal pressure hydrocephalus
- Oncological conditions – acoustic neuroma / other CNS malignancy
- Opsoclonus myoclonus ataxia syndrome
- Spinocerebellar atrophy
- Traumatic brain injury, such as:
  - concussion
  - inflicted injury

Conditions – muscle, peripheral nerves, and spinal cord

- Ataxia telangiectasia
- Autonomic ganglionopathy
- Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP)
- Friedrich ataxia
- Guillain–Barré syndrome
- Hereditary spastic paraplegia
- Medication-related peripheral neuropathy
- Myositis
- Neuromuscular conditions
- Oncological conditions
- Peripheral nerve diseases, such as:
  - Charcot–Marie–Tooth disease
  - riboflavin transporter deficiency
  - vitamin B12
- Spinal hematomas / collections
- Transverse myelitis
- Traumatic injury

Conditions – other

- Anxiety syndromes
- Functional neurological disorder
- Infections
- Labyrinthitis / vestibulitis, acute
- Medication or drug toxicity
- Migraine with brainstem aura and vestibular migraine
- Persistent postural-perceptual dizziness
- Postural orthostatic tachycardia syndrome (POTS) and postural hypotension

	• Recurrent vertigo of childhood and related conditions	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Acute, chronic, common, and rare diseases that cause: » disequilibrium » disorders of gait and balance » dizziness » vertigo • Neuroanatomy and neurophysiology of the: » neurological pathways involved in gait and balance » vestibular and cerebellar systems • Neurodevelopmental features and examination findings of normal preterm and term infants • Time-course importance and the associated clinical features in reaching a diagnosis	
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.	**Assessments** • Caloric testing • Dix–Hallpike manoeuvre • Head impulse test **Cerebrospinal fluid (CSF) procedures and investigations** • Lumbar puncture (LP) and interpretations results of investigations, such as: » basic CSF analysis: o cell count o cytology o immunological tests o microbiological tests o paired lactate o paired glucose level o protein level o xanthochromia » opening pressure » special tests: o amino acids o neurotransmitters o oligoclonal bands **Clinical neurophysiology investigations** • EEG: » sleep-deprived EEG » standard EEG » video EEG • Electromyography (EMG): » needle EMG » single-fibre EMG • Evoked potentials: » brainstem » somatosensory » visual • Nerve conduction studies (NCS): » motor and sensory studies » repetitive nerve stimulation **Neurogenetic investigations** • Genetic testing, including but not limited to: » chromosomal testing, such as: o karyotype o microarray » genomic testing, including whole exome or genome sequencing » mitochondrial genome sequencing	

    - targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
    - CT angiography
    - perfusion
- Functional imaging:
    - functional MRI (fMRI)
    - PET
    - single photon emission computed tomography (SPECT)
- Magnetic resonance:
    - angiography (MRA)
    - spectroscopy (MRS)
    - venogram (MRV)
- MRI
- Vascular imaging:
    - catheter angiography
    - Doppler ultrasound

Neuroimmunology investigations

- Autoantibody measurement:
    - anti-acetylcholine receptor antibodies
    - anti-aquaporin 4 antibodies
    - anti-muscle-specific kinase (MuSK)
    - anti-myelin oligodendrocyte glycoprotein (MOG)
- Referral to a neuroimmunologist

Neuropathology investigations

- Biopsy:
    - brain
    - muscle
    - nerve

Neuropsychological investigations

- Cognitive screening:
    - Mini-Mental State Examination
- Referral to a neuropsychologist

Other investigations

- Cardiac investigations:
    - 24-hour electrocardiogram monitoring
    - ECG
    - echocardiography
- Lung function tests:
    - formal lung function tests
    - vital capacity
- Other laboratory tests:
    - 24-hour urinary catecholamines
    - calcium, magnesium, and phosphate
    - creatine kinase
    - drug levels
    - liver function tests
    - thyroid function
    - ultrasound:
        - abdomen
        - pelvis
    - vitamins:
        - B12
        - C
        - D
        - E
        - thiamine

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.

- Overlap with other allied health and medical specialties, such as:
  - ear, nose, and throat (ENT) surgery
  - physiotherapy
  - rehabilitation medicine
- Prognosis and implications of these disorders

KEY PRESENTATIONS AND CONDITIONS

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

Presentations – hyperkinetic

- Ataxia
- Athetosis
- Ballismus
- Chorea
- Difficulty speaking and swallowing
- Dystonia
- Fasciculations
- Jitteriness
- Myokymia
- Stereotypies
- Tics
- Tremor

Presentations – hypokinetic

- Bradykinesia
- Catatonia
- Depression and/or mood changes
- Postural instability

Conditions – hyperkinetic

- Ataxia:
  - » acute cerebellar ataxia, including:
    - o acute cerebellitis
  - » episodic ataxias
  - » hereditary ataxia syndromes:
    - o ataxia with oculomotor apraxia:
      - ▪ type 1
      - ▪ type 2
    - o ataxia-telangiectasia
    - o dentatorubral-pallidoluysian atrophy
    - o Friedreich ataxia
    - o spinocerebellar ataxia
- Cerebral palsy (CP)
- Chorea:
  - » benign hereditary chorea
  - » CP, including:
    - o secondary to hypoxic ischaemic encephalopathy
  - » glutaric aciduria
  - » Huntington disease
  - » metabolic abnormalities
  - » Sydenham chorea
  - » Wilson 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[26] 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

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

- Dystonia:
  - » blepharospasm
  - » hemifacial spasm
  - » primary dystonias, such as:
    - o adolescent-onset dystonia of mixed type (DYT6)
    - o dopa responsive dystonia (Segawa disease)
    - o early-onset torsion dystonia (DYT1)
    - o myoclonus dystonia (DYT11)
    - o rapid-onset dystonia Parkinsonism (DYT12)
  - » secondary dystonia:
    - o acute dystonic reaction
    - o neuroleptic malignant syndrome
    - o oculogyric crisis
    - o serotonin syndrome
  - » status dystonicus
- Myoclonus:
  - » hyperekplexia
  - » myoclonic epilepsies
  - » primary myoclonic disorders:
    - o benign myoclonus of early infancy
    - o epileptic myoclonus of early infancy
    - o essential myoclonus
    - o myoclonus dystonia
  - » secondary myoclonic disorders
  - » startle epilepsy
- Other:
  - » baclofen withdrawal
  - » benign sleep myoclonus
  - » functional neurological disorders
  - » stereotypies
  - » Tourette syndrome and tic disorders
- Rett syndrome
- Tremor:
  - » drug-induced tremor
  - » essential tremor, and essential tremor plus
  - » metabolic / systemic causes of tremor

Conditions – hypokinetic

- Drug-induced Parkinsonism
- Functional neurological disorders
- Neurometabolic conditions
- Normal pressure hydrocephalus
- Progressive supranuclear palsy
- Sleep disorders, including:
  - » catatonia
- Structural brain abnormality
- Traumatic brain event:
  - » haemorrhage
  - » space-occupying lesion
  - » vascular

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

- Cervical dystonia
- Facial dystonia
- Neurotransmitters disease
- Niemann–Pick disease type C
- Palatal tremor
- Parkinsonian syndromes
- Paroxysmal dyskinesias
- Treatable neurometabolic movement disorders, such as:
  - » congenital folate deficiency
  - » glucose transporter 1 (GLUT1)
  - » vitamin E deficiency

EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES

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

- Acute, chronic, common, and rare diseases that cause disorders of movement
- Neuroanatomy, neuropharmacology, and neurophysiology of the motor pathways
- Type of disorder, including:
  - » associated clinical features
  - » localisation
  - » time-course

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.

Cerebrospinal fluid (CSF) procedures and investigations

- Lumbar puncture (LP) and interpretations results of investigations, such as:
  - » basic CSF analysis:
    - o cell count
    - o cytology
    - o folate
    - o immunological tests
    - o microbiological tests
    - o paired glucose level
    - o protein level
  - » opening pressure
  - » special tests:
    - o CSF neurotransmitters
    - o neopterin – CSF
    - o oligoclonal bands

Clinical neurophysiology investigations

- EEG:
  - » sleep-deprived EEG
  - » standard EEG
  - » video EEG

Neurogenetic investigations

- Genetic testing, including, but not limited to:
  - chromosomal testing, such as:
    - karyotype
    - microarray
  - dystonia genes:
    - DYT1
    - DYT5
    - DYT6
    - DYT11
    - DYT12
  - genomic testing, including whole exome or genome sequencing
  - mitochondrial genome sequencing
  - targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - CT angiography
- Functional imaging:
  - functional MRI (fMRI)
  - PET
  - single photon emission computed tomography (SPECT)
- Magnetic resonance:
  - angiography (MRA)
  - spectroscopy (MRS)
  - venogram (MRV)
- MRI

Neuroimmunology investigations

- Anti-deoxyribonuclease B (anti-DNase B) titres
- Antistreptolysin O (ASO) titres
- Autoantibody measurement:
  - anti-acetylcholine receptor antibodies
  - anti-aquaporin 4 antibodies
  - paraneoplastic antibodies

Neuropathology investigations

- Biopsy:
  - brain
  - muscle

Neuropsychological investigations

- Cognitive screening:
  - Mini-Mental State Examination
- Referral to a neuropsychologist

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - ECG
  - echocardiography
- Lung function tests:
  - formal lung function tests
  - vital capacity
- Other laboratory tests:
  - acanthocytes
  - alpha-fetoprotein
  - B12 level
  - ceruloplasmin
  - coenzyme Q
  - copper
  - creatinine kinase

	» drug screen » fasting lipid profile » IgG subclasses » thrombophilia screen » urinary porphyrins » vitamin E • Polysomnography
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.	• Overlap with other allied health and medical specialties, such as: » medical genetics » physiotherapy » rehabilitation medicine • Prognosis and implications of these disorders

KEY PRESENTATIONS AND CONDITIONS

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

Presentations

- Abnormal movements
- Acidosis
- Bowel changes, such as:
  - » diarrhoea
  - » reduced bowel motions
  - » stained meconium
- Breathing difficulties, such as:
  - » apnoea
  - » respiratory distress
- Cyanosis / Pallor
- Developmental and/or growth delays
- Fever or low body temperature
- Hyperflexibility / Hypotonia
- Intrauterine growth restriction (IUGR)
- Lethargy
- Low heart rate
- Microcephaly
- Muscle weakness
- Neonatal seizures
- Poor reflexes
- Spasms
- Tonic motor activity and posturing
- Vomiting and/or poor feeding

Conditions

- Congenital and neonatal infections
- Disorders of prematurity
- Hypotonia:
  - » disorders of the anterior horn cell, such as:
    - o spinal muscular atrophy
  - » disorders of the peripheral nerve
  - » genetic and central nervous system disorders, including:
    - o Prader–Willi syndrome
  - » myasthenic syndromes
  - » myopathy
  - » myotonic dystrophy
  - » systemic disease / illness
- Hypoxic ischaemic encephalopathy, including:
  - » periventricular leukoencephalopathy
- Inborn errors of metabolism
- Neonatal seizures
- Postnatal complications of maternal antenatal disease

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» involve multidisciplinary teams

Consider other factors

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

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	• Stroke: » haemorrhagic » ischaemic	
EPIDEMIOLOGY, PATHOPHYSIOLOGY, AND CLINICAL SCIENCES Advanced Trainees will have a comprehensive depth of knowledge of the principles of the foundational sciences.	• Clinical correlates, pathophysiology, and prognosis of neonatal encephalopathy, including: » hypoxic ischaemic encephalopathy » periventricular leukomalacia • Differential diagnosis, investigation, and management plans for neonatal seizures • Disorders of metabolism in the newborn period • Evaluation and management of perinatal stroke • Impact of maternal disorders and prenatal neurologic diagnoses on the fetus • Neurodevelopmental features and examination findings of normal preterm and term infants	
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.	**Cerebrospinal fluid (CSF) procedures and investigations** • Lumbar puncture (LP) and interpretations results of investigations, such as: » basic CSF analysis: o cell count o cytology o immunological tests o microbiological tests o paired serum and: ▪ CSF lactate ▪ CSF glucose level o protein level o xanthochromia » Special tests: o CSF amino acids o neurotransmitters, including: ▪ neopterin o paired serum and CSF oligoclonal bands **Clinical neurophysiology investigations** • EEG: » amplitude integrated EEG (aEEG) » standard EEG » video EEG • Electromyography (EMG): » motor and sensory studies » needle EMG » nerve conduction studies (NCS) » repetitive nerve stimulation » single-fibre EMG **Neurogenetic investigations** • Genetic testing, including, but not limited to: » chromosomal testing, such as: o karyotype o microarray » genomic testing, including whole exome or genome sequencing » mitochondrial genome sequencing » newborn screening test	

- targeted panel testing
- Referral to a neurogeneticist

Neuroimaging investigations

- CT, including:
  - CT angiography
- Magnetic resonance:
  - angiography (MRA)
  - spectroscopy (MRS)
  - venogram (MRV)
- MRI

Other investigations

- Cardiac investigations:
  - 24-hour electrocardiogram monitoring
  - ECG
  - echocardiography
- Other laboratory tests:
  - ammonia
  - blood gas
  - creatine kinase
  - liver function tests
  - thrombophilia screen
  - thyroid function tests
  - transferrin isoforms
  - white cell enzymes
- Polysomnography

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.

- Approach to breaking bad news and future counselling of a child with neurological diagnosis at birth
- Approach to emergency management and escalation of therapy for neonatal seizures
- Approach to introduction of the palliative care team
- Approach to neurological assessment of a newborn, including:
  - antenatal
  - birth
  - comprehensive examination
  - genetic history
  - maternal
- Approach to the hypotonic newborn
- Discussion of life-limiting diagnosis and end-of-life considerations